ROADS AND STREETS

February, 1960

A GILLETTE PUBLICATION

UNIVERSITY MICROFILMS
EUGENE B. POWER
313 N. 1ST. ST.
ANN ARBOR, MICH.
COMP-LRV-11-50

Contractor Management, Job Methods

9 features in this issue

6 UNITS ABREAST FOR MAXIMUM COVERAGE

*

6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION

4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS

*

5 UNITS IN TANDEM AND STAGGERED, VARIABLE FOR A WIDE RANGE OF WIDTHS

*

4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.

SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.

*Attainable with optional equipment.

may be pushed or pulled by any prime mover capable of working speeds as low as 50 FPM; towed to location at any road speed; operated in either direction; controlled by prime mover operator. Two workheads, with as many as 4 units each may be employed, one ahead and one following trailer. Power plant supplies both single and 3-phase 110-115 volt, 60 cycle A.C. and has many uses.

JACKSON Your Best Bet for RAPID, MONEY-SAVING COMPACTION!

In laying macadam base courses of very coarse aggregate (¾" to 3½") for instance, a single spread 12" thick usually can be perfectly compacted with just two passes of a JACKSON COMPACTOR. Time required is just about one-half that required for rolling . . . and appreciable savings are effected by single course spreading. Fines can be laid in thicker layers, with no hand brooming required, and each spread thoroughly infiltrated in a single pass.

For compacting granular soils in practically all applications, JACKSON COMPACTORS are terrific economizers of both time and money . . . the most efficient and versatile machines in the compacting category. See them at your nearby JACKSON Distributor who has them both for sale and for rent. Literature on request.

BOTH MACHINES OPERATE IN EITHER DIRECTION, NO TURNING REQUIRED

JACKSON VIBRATORS, INC.

LUDINGTON • MICHIGAN

. . . for more details circle 322 on enclosed return postal card

Completely portable Lima A-W crushing installation has primary 20 by 36-in. jaw crusher, Model 101-CE secondary plant and 7-yd. surge bin. Delivers exceptionally high production for Maymead Lime Co. in Tennessee.

How Lima Austin-Westerns BEAT RISING COSTS!

Higher output, lower maintenance. These two cost reducers are characteristic of Lima Austin-Western Crushing, Screening and Washing equipment.

Advanced engineering design assures top operating efficiency for years—free of maintenance problems and costly downtime. Improved manufacturing processes and extensive use of anti-friction bearings and heat-treated alloy steels also add to the dependability of this rugged, precision-built machinery.

Lima A-W offers a complete crushing, screening and washing line including jaw and roll crushers, matching screens, conveyors and bins. Stop increasing costs; learn how Lima Austin-Western meets your exact needs for low-cost, accurately sized specification materials. See your nearby distributor or write to Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

Lima Austin-Westerns available for stationary or portable installation.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

607

. . . for more details circle 282 on enclosed return postal card

ROADS AND STREETS February, 1960

HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

Industry Affairs, Meeting Reports	19	Washington News Letter
	20A	Special News Letter—New Road Education Program Launched
Construction Management, Job Methods	53	Omitted Income vs Loss of Profits (Constructive Cost Controls)
	54	7 Prestressed Bridges in One Contract
	61	Job Ideas: Balloon-Tired Graders Do It
	62	Keep Flexible: Creed of Third Generation Earthmovers
	68	Michigan Launches a Construction Safety Program
	70	Jet Flame Cuts Granite Piers
	84	Job Clean-Up
	88	High-Strength Bolting
Equipment Utilization	50	Rescue by Ripping
	76	Tandem Scrapers: "New-Old" Competitive Tool
Engineering and Technical	82	Aggregate Supplier Furnishes Lab Setup
	118	California's Program for Getting Good Construction
	140	Hot Mix for Thin Surface Treatments
	152	Everyone Can Help
Departments	24	People
	36	New Publications
	46	Meetings
	49	Editorial (Getting Roads Well Built, Still the Fundamental)
	154	Court Decisions
Where to Buy It	127	Reader Inquiry Card
	125	New Products
	173	Manufacturers' Literature
	175	With the Manufacturers and Distributors
	161	Clearing House (Used Equipment Advertising)
	176	Advertisers' Index

Accepted as Controlled Circulation Publication at Milwaukee, Wisconsin. Published monthly. Subscription $6.00 per year ($7.00 foreign.) Form 3579 requested to be returned to Gillette Publishing Company 22 W. Maple St., Chicago.

NEW PLUS ON PROFIT

Great new Goodyear tread cuts tire costs!

ON NEW SUPER ROAD LUG—a tougher tread utilizing advanced super-toughening agents mated to the toughest body known! This recently perfected tread compound matches the ruggedness of 3-T (nylon or rayon) Processed Cord! Result: an outstanding example of Goodyear's *toughest tires on earth!*

Now longer wear can reduce tire costs to build your profit. The bigger the job, the more you'll save with SUPER ROAD LUG on your wheels.

You'll find it keeping construction jobs going full blast, with its super traction rolling heavy equipment over the roughest ground, up the steepest grades and over smooth highways alike.

And new SUPER ROAD LUG takes the aggravated flexing caused by huge loads jouncing over rough terrain—thanks to its tough body built with 3-T (nylon or rayon) Processed Cord. This famous cord, triple-tempered by the exclusive Goodyear process involving Tension, Temperature and Time, has matchless strength and stamina.

Get onto the new performance and savings you'll have with this new super-tough SUPER ROAD LUG. Call your Goodyear dealer—or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

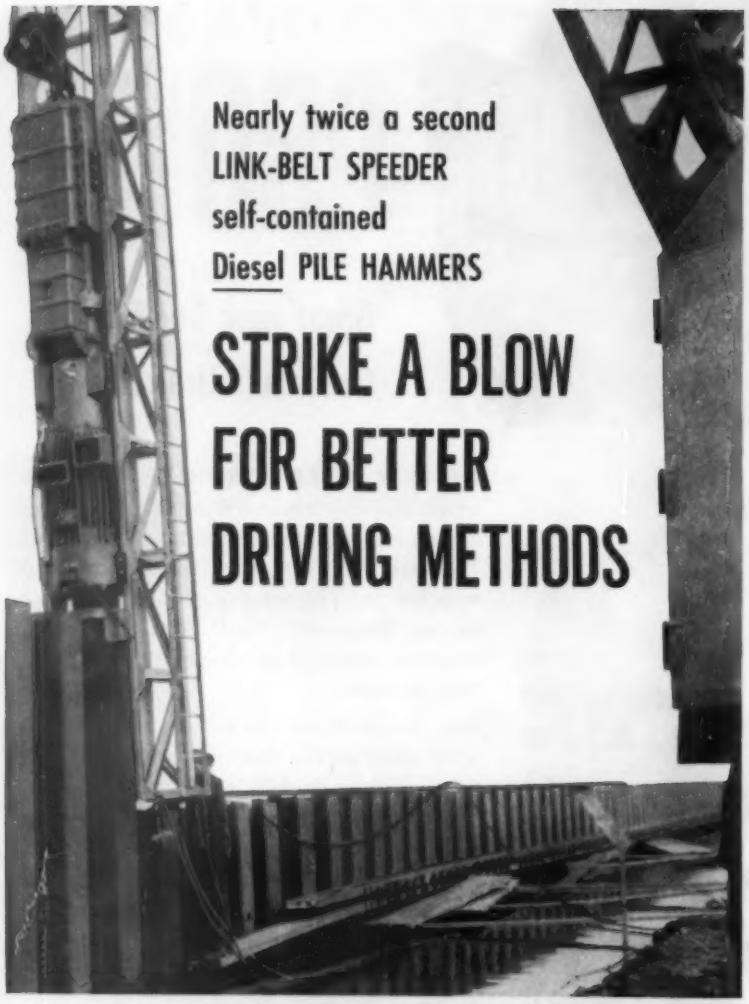
THE WORLD'S TOUGHEST TRUCK TIRES BY

GOODYEAR

Road Lug —T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

. . . for more details circle 307 on enclosed return postal card



Nearly twice a second
LINK-BELT SPEEDER
self-contained
Diesel PILE HAMMERS

STRIKE A BLOW FOR BETTER DRIVING METHODS

Tri-Power cycles...keep the pile in motion longer

Tri-Power cycles — pile *preloading*, high *impact* and two-way *explosion* — keep the pile in motion *longer!* Result: you can forget about brooming, spalling, flanging of piling. count on extra-profitable hours of actual pile driving time.

One-Man Operation

More savings! Just one man controls both hammer and crane from the cab.

Hammers up to 7,500, 18,000 and 30,000 ft. lbs. per blow. Easy setup. Simply put hammer in leads. Hook up throttle control. No struggle with clumsy compressors, boilers, auxiliaries. And add these:

104-59N

• **Exclusive** enclosed head acts as "air spring" — short stroke, fast ram return, more blows per minute means more piling driven. *No* dirt fouling.

• High-pressure fuel injection system and exclusive "glow plug" provides easier starting in cold weather and in soft ground.

• Choice of driving heads.

Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

Ask your Link-Belt Speeder Distributor for free Diesel Pile Hammer Bulletin No. 2582-A.

LINK-BELT SPEEDER

Also builders of a complete line of shovel-cranes . . . ½ to 3-yd., 8 to 75-ton capacities.
. . . for more details circle 327 on enclosed return postal card

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 68 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

HAROLD J. MCKEEVER, *Editor-in-Chief*
V. J. BROWN, *Vice Pres. and Treasurer*
CHARLES T. MURRAY, *Managing Editor*
JOHN C. BLACK, *Associate Editor*
JAMES R. CUMMINGS, *Associate Editor*
H. K. GLIDDEN, H. G. NEVITT,
C. R. SHUPE, R. L. PEURIFOY,
Contributing Editors
DUANE L. CRONK, *Washington Editor*
DOUGLAS MCDONOUGH, *Assistant Editor*
HELENA JUNG, *Production Editor*
GEORGIA ZOGRAFOS, *Editorial Secretary*

BPA

GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices:
22 West Maple Street, Chicago 10, Ill.

HALBERT P. GILLETTE,
Founder and President, (1869-1958)

W. E. GILLETTE,
President and Publisher

HALBERT S. GILLETTE,
Vice President and Assistant Publisher

V. J. BROWN,
Vice President and Treasurer

Chicago Office: 22 West Maple St. Superior 7-1581. R. T. Wilson, Gen. Sales Manager; Fred H. Bowes, Representative; E. Bender, Clearing House Manager; J. L. Latta, Production Manager; L. R. Vickers, Circulation Manager; A. W. Lehmann, Research Director.

New York Office: 15 E. 40th St., New York 16, N. Y., Oregon 9-7750. F. A. Michel Jr., Eastern Manager.

Cleveland Office: Trace Building, 3100 Wooster Rd., Cleveland 16, Ohio, Edison 1-2267, Ray Keine, Manager.

West Coast Office: 1126 Del Rey, Pasadena, Calif., Sycamore 4-6328, J. A. Osborne, Manager.

OTHER GILLETTE PUBLICATIONS

Rural Roads • Street Engineering
World Construction • Caminos y Construcción Pesada

CRACKS IN CONCRETE: *why they occur—how to control them*

Cracking is one of the most misunderstood problems in concreting, and is generally regarded as a sign of defective concrete. On the contrary, most cracking is the result of improper construction practices and can be controlled by simple precautions.

Like other construction materials, concrete contracts and expands under various conditions of moisture and/or temperature. This normal movement should be anticipated and provision made for it in the design, placement and curing of concrete, otherwise cracks may result.

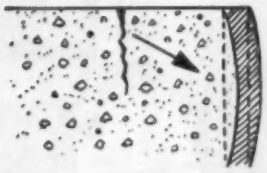
Generally, most cracking is caused by stresses exerted in or on new concrete while it is still "green"—before it has gained sufficient strength to resist such forces. A majority of cracks occur during the first few days after concrete is placed. As a rule, most cracks result from:

• Shifting of concrete before it hardens
• Shrinkage and expansion of concrete before and after hardening.

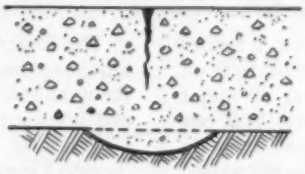
Shifting Before Hardening

This condition can cause cracks that are extremely difficult to diagnose. See Figures A, B and C. These cracks are caused by forces resulting from improper construction practices such as:

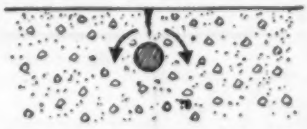
• Unstable forms • Unstable subgrade (uncompacted, frozen, muddy) • Subbase paper rupturing on uneven subgrade • Jarring of unstable ground • Improper placement of reinforcement (too close to surface).



A Bulging or shifting of forms due to timber expansion, loosening of nails or clamps, weak form construction, etc., can cause cracks having no particular pattern. Concrete surface distortion is usually the sign of form shifting.



B Subgrade paper rupture or poor subgrade allowing concrete to shift while setting can cause cracking as shown above.

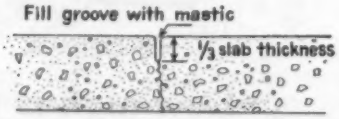


C When concrete settles over obstructions such as reinforcing steel, cracks may occur. This cracking can be prevented by using low-slump concrete and stable subgrade or good footings on good solid ground.

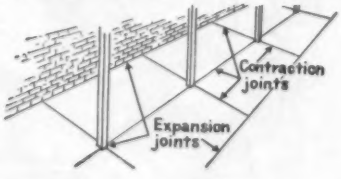
Shrinkage and Expansion

While concrete is plastic or fresh, it occupies its largest volume. When dry, cold and completely carbonated, it has its smallest volume. Varying conditions of moisture, temperature and age between these extremes cause concrete to shrink and expand slightly. Unless provision is made for these normal volume changes, and good concreting rules are observed, cracks may result. Shrinkage during hardening and drying can be greatly reduced by using as little mixing water as possible, dampening the subgrade and forms, and curing the concrete properly.

Shrinkage cracks can be prevented or effectively controlled by contraction and expansion joints, and use of low slump concrete.



D Contraction joints should be placed at points of stress concentration so that in case of shrinkage, cracking will occur neatly beneath the joint as shown in Fig. D. They can be neatly finished so final appearance of the structure is not marred. In sidewalks, place joints at 5′ or 6′ intervals. In driveways, place them at 15′ to 20′ intervals. In large floors, place joints at 15′ to 20′ intervals. In buildings divided into bays by columns, place joints where shown in Fig. E, but seldom over 20′ apart unless adequate steel is used. Cracks in solid concrete walls are minimized by using low slump concrete. Narrow feathering of concrete sections should be avoided to prevent cracking.



E Expansion joints should be placed at junctions of walks with driveways, buildings, curbs, light standards; where a floor joins a column base, stairway, etc., or anywhere else that concrete freedom of movement may be restricted.

Joints cannot be expected to prevent or fully control situations such as:

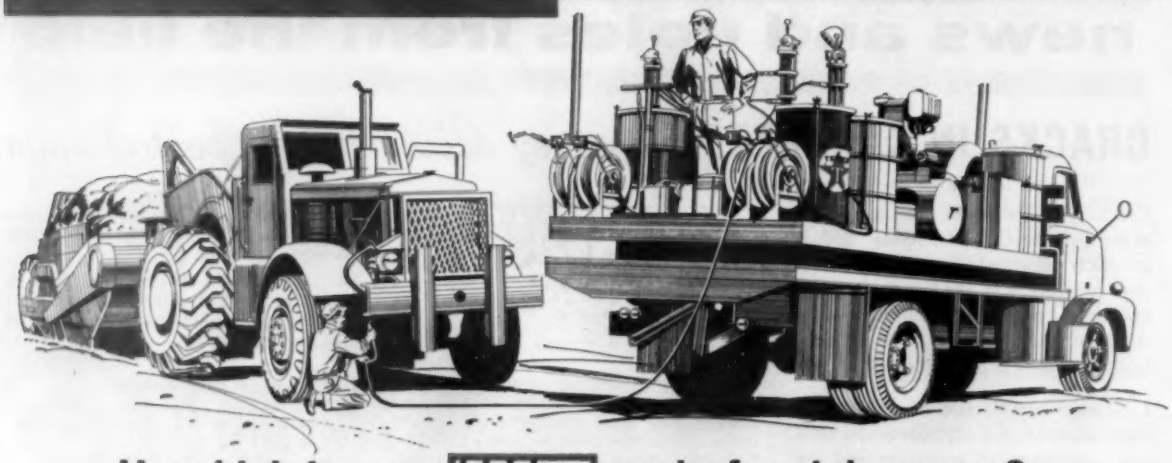
• Dry subgrade • Drying due to weather immediately after finishing • Carbonation in initial stages of curing • Lack of protection from low humidity atmosphere.

For more information on causes and control of cracking, ask your Alpha representative or write for the Craftsmanship in Concrete folder: "Cracks in Concrete".

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.
. . . for more details circle 280 on enclosed return postal card

LUBE LOGIC

Six tips to

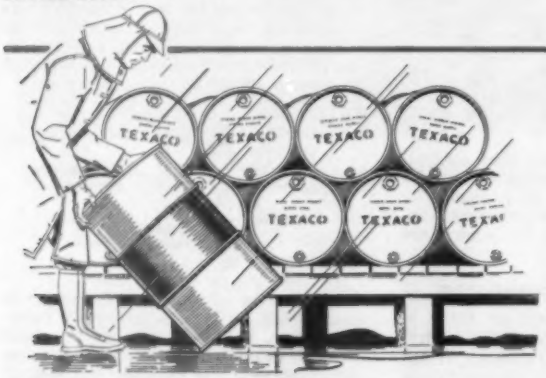


How high is your hidden cost of maintenance?

You may not realize how many extra maintenance dollars you spend when you keep many different lubricants on hand. (Six are often all you need to cover all major maintenance.) You pay extra for inventory. You pay extra for storage and handling. It costs you more in paperwork to order. And you'll have to figure the wasted cost of equipment parts and downtime if misapplication should occur.

The Texaco Lubrication Plan helps you reduce or even eliminate these hidden costs. That's because it provides the minimum number of *proven* multi-purpose and special lubricants, tailored to your job requirements.

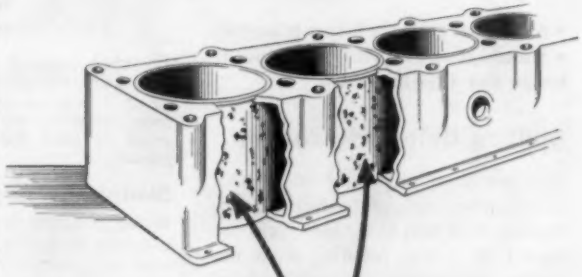
You'll do yourself a favor when you check with a Texaco Lubrication Engineer. He'll carefully plan your lubrication needs—then follow them up to see that your lubrication problems are taken care of fast.



The inside story on outside storage

You're short-changing yourself if you skip these simple precautions: drums stored outdoors should be placed on their sides. When stored on end, expansion and contraction through temperature changes can suck in rain water that collects on top of the drum.

Want to warm up lubricants that have become stiff from cold? *Don't* heat them with an open flame. You might melt the sealing compounds, and the drum will leak. You might also damage the product with too much heat in one spot. Put the drum indoors for a while before using.



Here's how to handle cylinder cavitation erosion

High pressure cooling systems in use in most supercharged diesels are subject to coolant aeration. This aeration can cause cavitation, leading to serious cylinder liner corrosion-erosion, unless a rust preventive is added to the water. A good antifreeze (like Texaco PT antifreeze) will do the job in winter—but in summer a 1% to 2% solution of Texaco Soluble Oil C will do a fine job. (Remember to flush out before you add antifreeze again.)

cut maintenance costs

OIL GAUGES SPEAK A LANGUAGE ALL THEIR OWN

Look to your oil gauge pressure for clues to a variety of potential engine ailments. For example:

LOW OR NONE

1. Oil pump pickup stuck high.

LOW

1. Clogged oil pump screen.
2. Excessive main, con-rod, camshaft or rocker-arm bearing clearances.
3. Clogged full-low filter, if by-pass isn't working.
4. Excessive dilution of oil with fuel.
5. Enlarged squirt holes.
6. Loose connections or cracks in oil line.

LOW OR ERRATIC

1. Faulty oil pump.
2. Restriction in oil pan, or oil too viscous to keep oil pump intake supplied.

LOW OR HIGH

1. Faulty gauge.
2. Ineffective oil cooler depending on type, may keep oil too cold or provide insufficient cooling.

HIGH

1. Oil with viscosity too high for climate.
2. Sludge and contamination in the oil.
3. Clogged oil passages on the pressure side.

HIGH, LOW OR ERRATIC

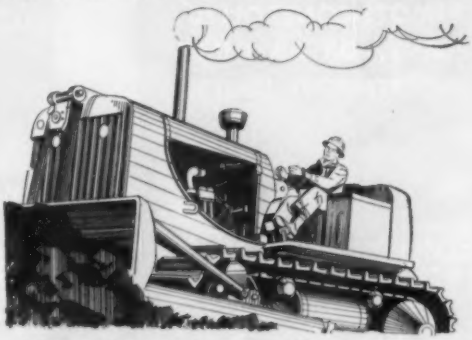
1. Improper setting or failure of pressure relief valve.

ERRATIC, LOW, THEN NONE

1. Crankcase oil level just at or below oil pump pickup.

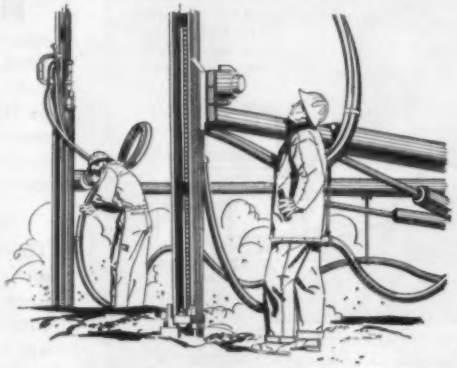
NO MOVEMENT OR DELAYED ACTION

1. Clogged line to gauge.



Don't let engines foul up!

If the fuel injector on a diesel drifts off or "dribbles," incompletely burned fuel will contaminate the crankcase. The result will be plenty of smoke—and probably engine trouble. The injector should be fixed immediately—but if it can't be, start shortening drain periods to remove the damaging oil-fuel mixture. Also, use an oil with full detergent and dispersion properties to keep other undesirable products out of the engine.



New product for rock drill couplings

Actually, it's an old friend, Marfak Heavy Duty #2, in a new application. According to the raves from customers who've tried it, the lubricant works better on rock drill couplings than anything they've ever used.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

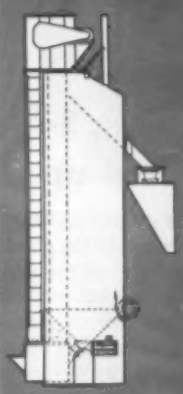
TEXACO

Throughout the United States

Canada • Latin America • West Africa

. . . for more details circle 348 on enclosed return postal card

THE JOHNSON "GOPHER" OPERATES AS A SINGLE REMOTE-CONTROLLED PLANT—OR AS THREE INDEPENDENT UNITS:

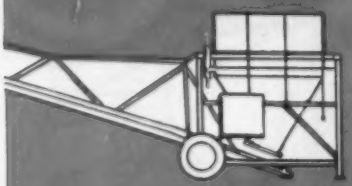


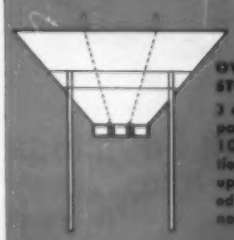
BULK CEMENT PLANT ON WHEELS

285-bbl. Porto-Silo, 8-ft. dia. with 130-bbl.-per-hour bucket elevator. (375-bbl., 9-ft. dia. silo also available.) 4,000-lb. cement batcher.

PORTABLE AGGREGATE BATCHER

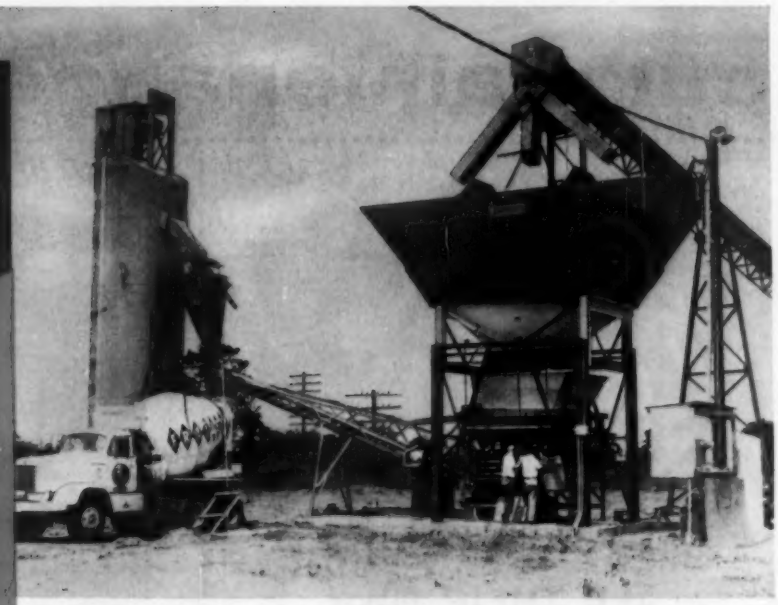
6 cu. yd. unit. Three 12,000-lb. weigh-beams. Electric control panel. Cable, plug-in connections to all motors. 24-in. belt conveyor.





OVERHEAD STORAGE BIN

3 aggregate compartments. 40 or 100-ton capacities. Quickly set up. No complicated structural work necessary.



60 to 70 cubic yards an hour

AT MINIMUM INVESTMENT IN PLANT EQUIPMENT

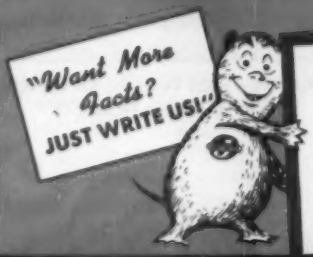
Here's your opportunity to cut aggregate and cement batching costs. On one-stop operation, the Johnson "Gopher" weighs out 60 to 70 cubic yards an hour — big output for only a minimum investment in batch plant equipment!

Pick-up-and-go portability

There's no complicated field assembly. All wiring, piping, air lines have pre-fit couplings and connections for quick, easy hook-up or disconnect. Any time you're ready to move to next job, just pick up and go! Complete wheel, axle, towing assemblies on cement silo and aggregate batch unit make moving easy. Quickly sets up anywhere. Flexible, too! Makes a complete one-stop batch plant — or operates as 3 separate units.

Everything pre-assembled

Big-capacity cement silo has self-contained bucket elevator system, boot hopper — and air-ram operated 4,000-lb. cement batcher, which can be remote-controlled from aggregate plant. Also in a single unit — aggregate batcher, discharge conveyor, auto-stop water meter with 2-in. piping. Independent overhead aggregate storage bin completes the "Gopher" plant. Everything you need in just 3 simple units — and at a low price that will surprise you! Better phone Johnson distributor, or write us today. You'll be glad you did!



JOHNSON

Mail to: **C. S. JOHNSON COMPANY, Champaign, Illinois**

Send "Gopher" ☐ spec. sheet ☐ bulletin ☐ Have distributor get in touch.

NAME _____ TITLE _____

COMPANY _____ DIV. _____

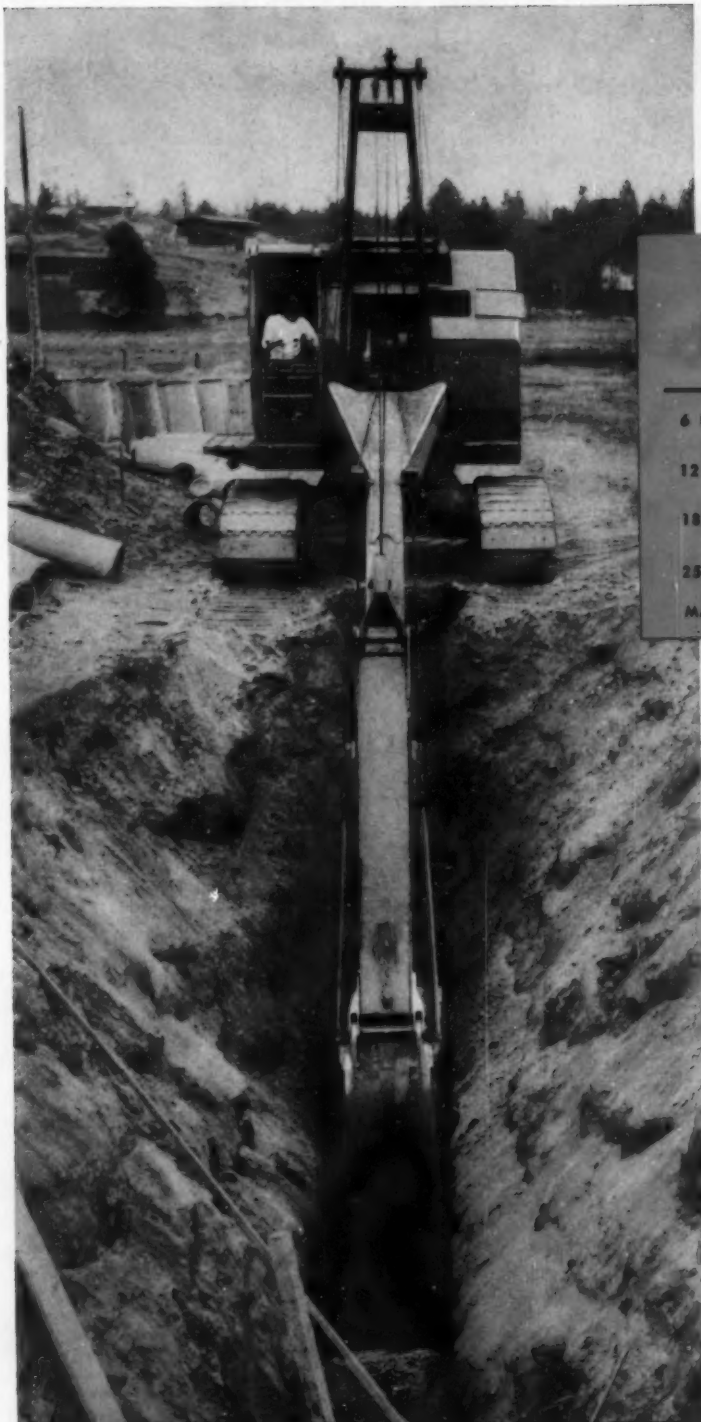
STREET _____

CITY, STATE _____ J4 B8

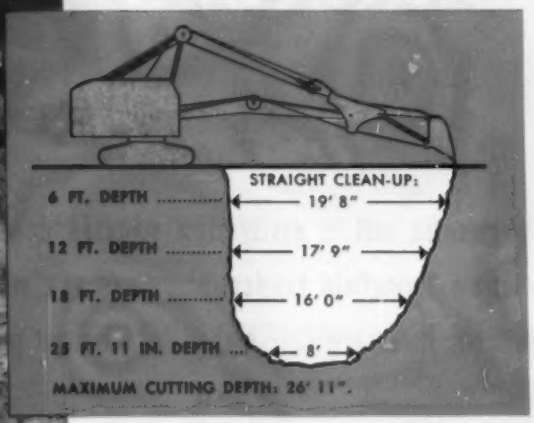
"Keep Your Eye on the Gopher" FROM **C. S. JOHNSON CO.** CHAMPAIGN, ILLINOIS STOCKTON, CALIFORNIA

(Division of Koehring Company)

. . . for more details circle 325 on enclosed return postal card



DIG MORE level FLOOR AT EVERY DEPTH



with Koehring 405 hoe

Ask any good hoe operator what it takes to get more feet of ditch per hour. He'll tell you it's the length of level-floor clean-up — at every digging depth, that counts! Any increase in level cutting action means fewer move-ups, more productive dig-hoist-swing-dump cycles, more feet of ditch per hour. That's why extra reach of Koehring® heavy-duty 405 hoe is so important to your job production schedules, and profits.

Consider this, too—long reach puts spoil bank well back beyond edge of cut—gives 13-foot clearance height at beginning of dump to load high-sided trucks. Big 1-yard dipper makes a wide cut—actual widths vary with job conditions and material to be dug. Variable settings of pitch braces allow quick adjustment of dipper angle to suit digging conditions.

Other capacities: 1-yard shovel; 1½-yard clamshell, dragline; 20-ton lift crane extend 405's extra work capacity over all jobs. Koehring distributor has complete details. Call him today. Or, send coupon for facts-by-mail.

SEND LITERATURE, SPEC. SHEETS ON 405 EQUIPPED AS:

☐ HOE ☐ DRAGLINE
☐ SHOVEL ☐ CLAMSHELL
☐ LIFT CRANE

Mail to: KOEHRING DIVISION, 3026 W. Concordia, Milwaukee 16, Wis.

NAME _____ TITLE _____
COMPANY _____ DEPT. _____
STREET _____
CITY _____ STATE _____

RS 1630

. . . Keep your eye on KOEHRING WORK CAPACITY

. . . for more details circle 324 on enclosed return postal card

interchange this ...get 3 to 7% higher

Segmented roll is easily field-mounted on any Buffalo-Springfield tandem . . . gives you more uniform compaction . . . higher densities per pass

A quick-change of guide rolls and you combine the special advantages of a projecting-lug roll — plus those of a smooth-faced roll — all in a single pass! Result: Up to 7% higher compaction densities on stabilized base-materials, crushed or broken stone, hot and cold bituminous mixes, earth-fills.

IN OTHER WORDS . . .

For any Buffalo-Springfield tandem roller, new, or in the field, your small investment in segmented-roll attachment virtually gives you two machines in one. You convert to segmented guide-roll for faster higher-density compaction . . . switch back to smooth-faced roll as job requirements demand. You *tailor* your machine to the job . . . meet specs faster and more profitably.

If you're interested in this flexible approach to more profitable rolling, send coupon for new 6-page bulletin. It tells the full story!

BUFFALO-SPRINGFIELD COMPANY
SPRINGFIELD, OHIO
(Division of Koehring Company)

Send complete information on profit opportunities with segmented rolls.

NAME _____

TITLE _____

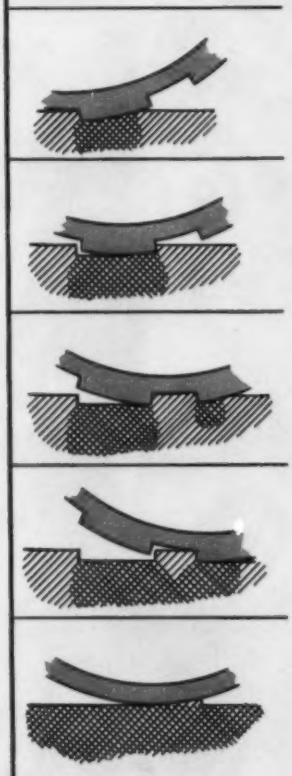
COMPANY _____

ADDRESS _____

CITY, STATE _____

RS B1

HOW SEGMENTED ROLL GIVES GREATER, MORE UNIFORM DENSITIES



Segmented pads enter vertically, with practically no lateral displacement of surface material. There's no build-up of material ahead of roll.

Spacing between staggered pads results in more compaction weight per unit of contact area. Compactive effort is from lower elevation up . . . results in more uniform top-to-bottom compaction.

Broad-faced special designed pads make clean exit . . . eliminate fluffing up of surface material, as occurs with lugs of sheepsfoot roller.

Because of bulb-shaped compactive effort, area below surface is knit tightly together in pattern of uniform density.

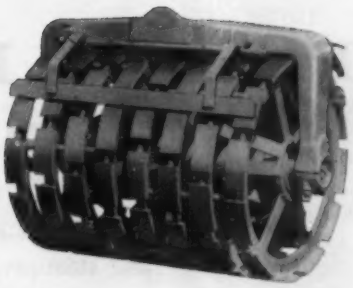
Follow-up action of smooth-faced drive roll easily takes care of shallow, web-shaped areas not compacted by segmented pads. (See photo next page.) End result: smooth surface, with uniform high-density compaction underneath.

The right roller for you

Portable tandems

Two-axle tandems

with this



compaction densities

SEGMENTED ROLL is faced with staggered rows of heavy steel pads . . . applies pressure in foot-print pattern. Roll is split in two free-rolling sections to minimize surface scuffing when making turns. To fit your needs for permanent or interchangeable use, they are available with or without separate axle and/or yoke.

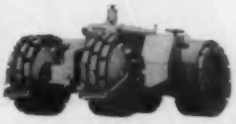
TWO AXLE TANDEM with segmented roll works on airport project in Ohio. With one machine and one operator, this contractor combines advantages of both crawler-drawn sheepsfoot roller, and conventional tandem roller . . . all in a single pass.

THREE-WAY COMPACTION ON EVERY PASS is achieved here, compacting sub-base for airport runway in Columbus, Mississippi. Three-axle Buffalo-Springfield roller above uses segmented lead guide roll, vibratory center guide roll, followed by smooth-face drive roll.

3-wheel rollers

Pneumatic rollers

K-45 Kompactor



3-axle tandems

3-axle vibratory

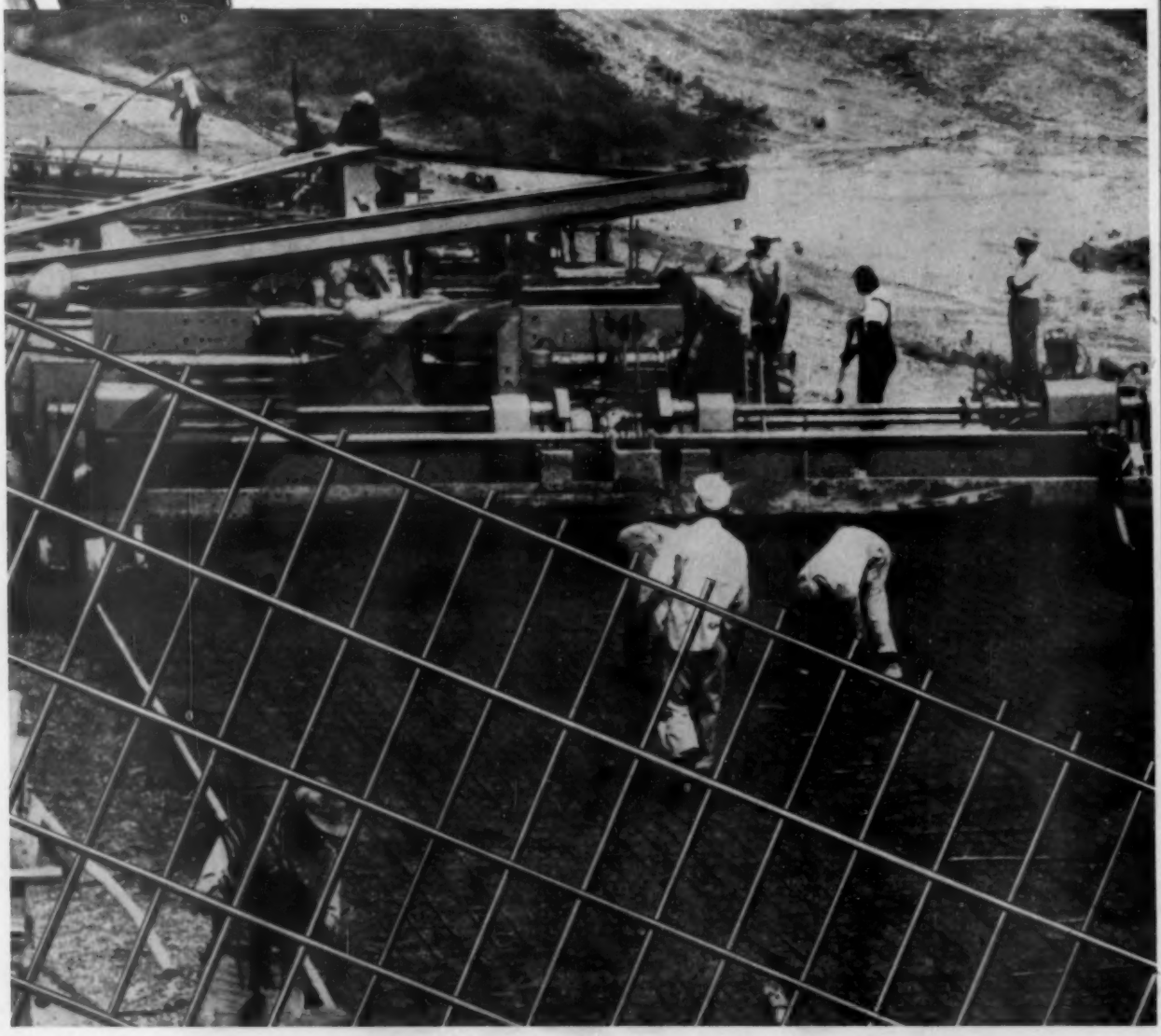
BUFFALO-SPRINGFIELD COMPACTION EQUIPMENT • FLAHERTY SPREADERS AND SWEEPERS • STARDRILL-KEYSTONE DRILLING MACHINES

. . . for more details circle 326 on enclosed return postal card

CF&I Steel Products and the Construction

For years, CF&I has been a prime supplier of steel and steel products for the construction industry. Continual research, one of the meanings behind our Corporate Image, has resulted in new and improved steel products for construction use.

CF&I has also earned a reputation among construction men for product dependability...swift,

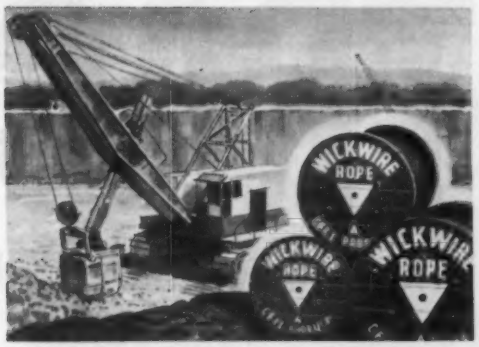


WELDED WIRE FABRIC: CF&I-Clinton Welded Wire Fabric gives concrete extra strength and resistance to cracking, and spreads load stresses over a wide surface. Available in all standard gages and furnished in rolls or mats for quick installation.

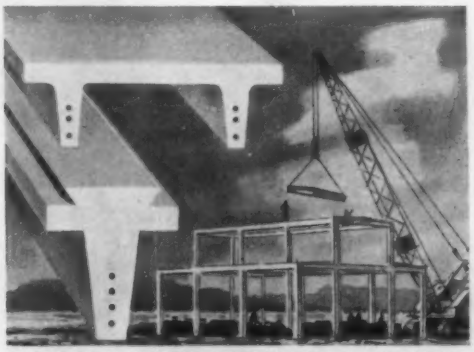
Industry

reliable delivery through distributors and warehouses... and in-field service to our customers.

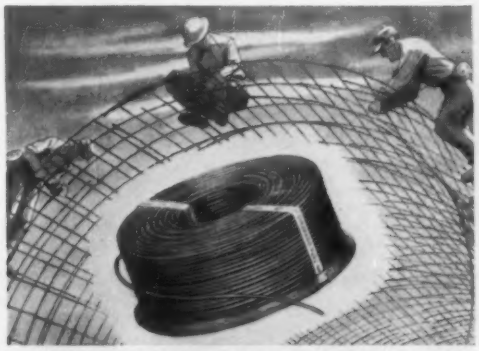
Always it is the aim of CF&I to help America's progress with the American-made steel products shown on these pages, along with a complete line of other steel items for the Construction Industry.



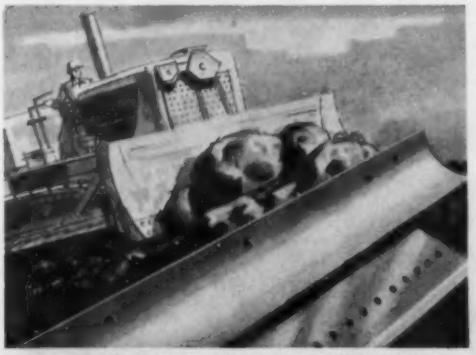
WIRE ROPE: CF&I-Wickwire Wire Rope is made in a broad range of grades and constructions, each designed to resist the punishment inflicted by different operations—abrasion, bending, crushing, or a combination of these wear factors. A complete line of Wire Rope Slings is also available.



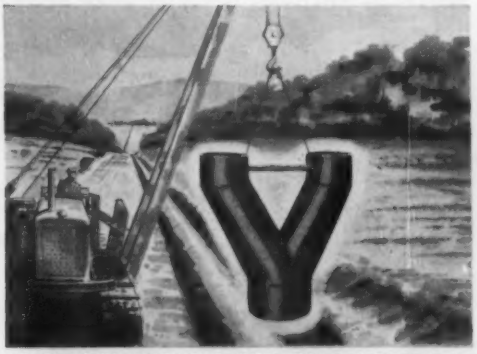
PRESTRESSED CONCRETE STRAND: Stress relieved after stranding, CF&I 7-wire Strand is flexible and easy to use. It is made to ASTM Specification A-416 and is ideal for pretensioning applications. CF&I also offers quick delivery on Prestressed Concrete Wire made to ASTM Specification A-421.



TIE WIRE: CF&I Cal-Tie Wire can't kink, tangle, snag or scratch, assuring maximum safety and economy in tying steel. That's because it is furnished for use in a handy belt dispenser that protects against hazards of loose coil ends. The wire comes in 16 gage. Reinforcing Bars are available in sizes No. 2 to No. 11.



GRADER BLADES: Scientifically designed, CF&I Blades and other Cutting Edges are carefully made of special analysis steel to eliminate hard or soft spots. This assures extra-long service. Wide selection of lengths, widths, thicknesses and hole spacings, flat or curved, beveled or squared edges.



STEEL PLATE PRODUCTS: CF&I's Claymont Plant fabricates many types of structural steel plate products—including weldments for underground water viaducts, base and bearing plates for bridges, expansion joints for penstocks, side seal plates for guide gates on dams, and many others.

For complete information on all products, ask for Catalog G-104, "CF&I Steel Products for the Construction Industry."

7471

THE COLORADO FUEL AND IRON CORPORATION

DENVER • OAKLAND • NEW YORK

CF&I STEEL

. . . for more details circle 293 on enclosed return postal card

TRACTION when and where you want it

WITH INTERNATIONAL TANDEM-AXLE ALL-WHEEL-DRIVE CHASSIS

Start operations up to 30 days ahead of changeable spring weather with this husky INTERNATIONAL model RF-210 (6x6) chassis that's ideal for transit-mix use. Excellent flotation of the INTERNATIONAL tandem combined with the extra traction of all-wheel drive allows you to get a head start on competition.

Now you can get to the job with heaviest payloads—and equally important, get out to come back for more—with INTERNATIONAL six-wheel *all-wheel-drive* chassis.

Schedules are met smoothly because INTERNATIONAL supplies the ideal combination of big, tough axle and frame for maximum payloads . . . and all-wheel drive to ease out of time-consuming bog-downs.

You can sell customers better service with INTERNATIONAL *all-wheel-drive* chassis. They add new flexibility to your fleet, new versatility to your business operations.

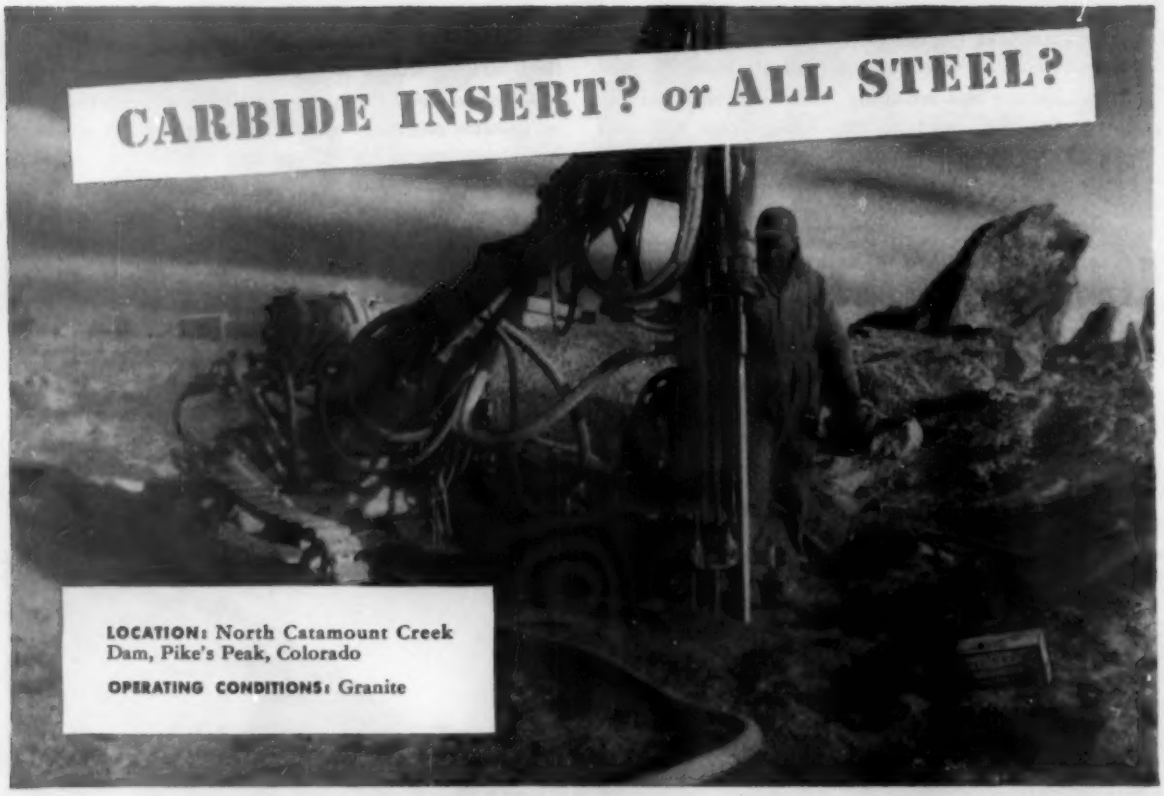
All-wheel-drive chassis are available with up to 501 cu. in. gasoline engine or optional LPG engine. Power steering, or any special feature you may need, is available, too. See your INTERNATIONAL Truck Dealer today.

INTERNATIONAL® TRUCKS

WORLD'S MOST COMPLETE LINE ®

INTERNATIONAL HARVESTER COMPANY • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

. . . for more details circle 320 on enclosed return postal card



Colorado Constructors Inc. reports...

"Drilling speed up 5%, feet of hole-per-bit up 10% with TIMKEN® carbide insert bits"

DRILLING through granite at the foot of Pike's Peak on a big dam job, Colorado Constructors Inc. selected Timken® carbide insert bits. They report that Timken bits gave them a 5% increase in drilling speed, plus 10% more feet of hole-per-bit.

You get results like that with Timken carbide insert bits in hard, abrasive ground. Their five front holes and deeper wing clearance help speed chip removal. Bits work more at drilling rock, less at "drilling" chips. And the tough, special analysis carbides last longer, help give more feet of hole-per-bit.

In ordinary ground, Timken all steel bits can save you more.

With correct and controlled reconditioning, they give you lowest bit cost per foot-of-hole when you can drill out full increments of steel.

Whatever type of Timken bit you use—whatever your drilling conditions—you'll save time and money. They're all interchangeable in the same thread series. Your drillers can change bits as fast as the ground changes without the trouble of changing drill steels.

Timken bits are made from our own electric furnace fine alloy steel. We're the only American maker of removable rock bits that takes the extra step of making its own steel. And the special shoulder union developed by the Timken Company gives extra protection to threads against drilling impacts.

Let us help you get the most economical—the right bit for all your drilling jobs. Call or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

Timken threaded all steel multi-use rock bit

Timken threaded carbide insert rock bit

TIMKEN® **removable rock bits**

. . . for more details circle 349 on enclosed return postal card

ROADS AND STREETS
Sixty-Six Years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services, Inc.

February 10, 1960

This month will see several Congressional committees open hearings on the National Highway Program. Some will be closed, others open. Actually, the only new legislation necessary this session is authorization of new federal-aid funds for the ABC Systems for the next two fiscal years. But the Ways and Means Committee was commissioned last year to investigate financing of the program. And Congressman Blatnik's committee probing conduct of the program is expected to air charges of collusion, right-of-way irregularities, and over-design.

* * *

The Administration's "balance-the-budget-at-all-costs" drive will definitely affect its leadership (or lack of leadership) in advancement of the National Highway Program this year. Last month President Eisenhower requested another one-half cent federal gasoline tax increase to give the multi-billion dollar effort a shot in the arm. In proposing the boost in his budget message to Congress, the President insisted that the new tax is imperative. With the additional revenue, he promised, the Interstate System construction program can proceed at "a higher and more desirable level."

The President pointed out that the Highway Trust Fund needed a $359 million advance last year, which must be repaid by this coming June 30, and that another repayable loan (of $200 million) must be made from the U.S. Treasury this year. The delicate condition of the Trust Fund will not permit confident advance planning, the Administration believes, and the new highway user levies would help carry it over the next few critical years.

ABC authorizations should be reduced, too, this year, the President said - from $925 million annually to $900 million. And finally, responsibility for financing of forest and public lands roads should be shifted from the general fund to the Highway Trust Fund.

The proposals have stirred little sympathy. Congressman Wilbur Mills, chairman of the House Ways and Means Committee, from which tax measures must originate, bluntly asserted that there would be no consideration given to any additional gasoline taxes this session. Referring to the 1 cent increase enacted late last session, he declared:

"We would never have imposed an increase in the gasoline tax for 21 months had we not been under the impression that those apparently speaking for the Administration were agreeing to a compromise."

The big fuss which President Eisenhower's advisor, General Bragdon, touched off before Christmas over elimination of urban links in the Interstate System seems to be simmering down, at least temporarily. Too hot to handle, the politicos have decided.

(continued on next page)

This month will see the state highway departments begin another estimate of the cost to complete their Interstate System mileage. The manual of instructions is expected out of the Bureau of Public Roads momentarily. Alfred Johnson, executive secretary of the American Association of State Highway Officials, predicts that the new estimate will not be much higher than the last one.

The BPR has eased some of the "red tape" surrounding the contract controls program. At first states were required to stay within certain limits for both expenditures and contract obligations. This double control was necessary, the BPR says, to slash activity in the last half of 1959. Now a higher volume is to be permitted, and only expenditures will be governed. Also, states have been given permission to proceed with preliminary engineering and right-of-way acquisition for future projects, thus letting out the clutch on the advance planning so drastically halted six months ago.

A new prediction of upcoming highway expenditures was released last month by the Bureau of Public Roads. According to the BPR forecasters, disbursements for highways by all levels of government will hit nearly $11 billion this year. Capital outlays will amount to $6,717 million; maintenance, $2,469 million, and debt service and administration, $1,779 million. The $10,965 million total compares with $10,884 million in 1959, $10,255 million in 1958, and $9,354 million in 1957.

* * *

Officials of the Bureau of Public Roads are distressed at the press publicity given last month to criticism which the General Accounting Office leveled at three state highway departments. There is another side of the story, they say. For examples:

• The GAO deplored what it called "restrictive" right-of-way laws in some states which "substantially increase the cost" of highways in those states. The BPR admits that streamlining of right-of-way procedures has been a long, tedious operation, but that numerous states have revised their laws and that even yet, certain safeguards must be maintained to prevent scandal and injustice to property owners.

• Some states place too much dependence upon consulting engineers to carry their design load, the GAO investigators reported. Actually, it is almost universally realized in highway circles that consultants have been responsible for getting the Interstate program off the ground in a number of states and that the cost involved has not been out of line.

• West Virginia was criticized by the federal auditing agency for not giving adequate notice on invitations for bids and thereby reducing competition. The BPR insists that the GAO's conclusion is unfounded. The average number of bids in West Virginia last year was 9.3 per project, compared to a national average of 7.4; and contractors' low bids were 19.3 percent under engineers' estimates.

• It is true, the BPR says, that a Maryland county used convict labor on secondary road construction, but the irregularity was discovered and the situation corrected before the GAO stumbled onto it.

In short, the Bureau maintains, much of the criticism produced by GAO investigations of the highway department administration is unfair, if not actually distorted. As is true on many such occasions, the investigators just do not understand state administrative and contractual practices.

Special ROADS AND STREETS Report

ROADBUILDING INDUSTRY LAUNCHES NATIONWIDE PUBLIC EDUCATION PROGRAM

A midwest contractor stood up in a committee room at the ARBA convention in Cincinnati last month and said simply:

"We'll put up $2,500."

Across the table another contractor from the East Coast took a long look at him, then raised his hand and said:

"We'll go the same."

Down the line an equipment manufacturer pledged his support, and other businessmen whose livelihood depends upon the health of the highway construction market stood to say they would shoulder their share of the load. Representatives from national industry groups promised the financial backing of hundreds of others.

Thus was launched a 1960 "good roads" movement hopefully designed to publicize the benefits of modern highways and to put the long-range National Highway Program back in the public spotlight. It was clearly the most newsworthy event to come out of the ARBA convention.

* * *

Four months ago, General Louis W. Prentiss, executive vice president of the American Road Builders Association, called together a group of top-notch representatives of the highway construction industry. He reviewed the legislative crisis which the Federal Aid Act of 1959 had just barely survived, and asserted that the future life of the National Highway Program depends upon a new revival of public support for the multi-billion-dollar undertaking.

"People don't appreciate the benefits; they don't understand the financing involved; and they aren't appealing to their Congressmen to keep the road program moving," he asserted. "So the highway program rocks along from one crisis to another, deadlocked over minor disagreements or stretched out another three or four years.

"If we are ever going to enjoy a continuous high level of highway construction, we are obviously going to have to build a solid floor of public support under the program - and that means selling highway benefits in terms the average man can understand and appreciate."

* * *

Members of the committee, many of whom have watched the unguided ups and downs of the roadbuilding market with dismay in recent years, were agreed. They went to work. Over the course of the past few months, subcommittees have been meeting to hammer out a workable policy statement, a program of promotional activities and financial possibilities.

(continued on next page)

In Cincinnati last month the full committee reviewed these accomplishments and decided the time had come to "talk turkey." The group agreed to organize a national Better Highways Information Committee completely independent of ARBA whose job it will be to promote the cause of good roads. The committee's prime function will be to collect basic facts on highway benefits and to publicize them in any reasonable manner likely to foster public understanding.

The job of raising at least $250,000 to finance the program was given to Paul Reinhold, president of the Atlas Equipment Company, former president of ARBA, and an accomplished fund-raiser for public service causes in his own city of Pittsburgh.

Mr. Reinhold does not anticipate that this will be a very difficult assignment. "The industry is convinced of the need, and some very powerful industry groups have promised their help in advance," he said.

* * *

The Associated General Contractors of America announced last week that it will contribute to the fund drive and to the subsequent promotional campaign. AGC vice president Clare Miller predicted that numerous AGC chapters around the country will get behind the movement.

Meanwhile, one of the best-known public relations firms in the U.S. has been asked to develop a national campaign which will carry the BHIC story to the grass-roots levels. Among other things, the firm will be asked to:

- Prepare basic information literature on highway needs and benefits.
- Prepare news releases and feature material which could be used by newspapers and magazines.
- Help to organize state-wide promotional events.

* * *

Last September, Roads and Streets magazine declared editorially, "We Need a New Crusade," and Editor Harold J. McKeever spelled out the kind of campaign likely to appeal to the American people and the responsibility of individual roadbuilders to get behind the new crusade. All of the elements of success are here - inspired leadership, a general recognition of need, the know-how and the resources. Here is an opportunity for the roadbuilding industry to stabilize its market and reap benefits for years to come. Here, too, is a responsibility - to convince the American people of the wisdom and urgency of a continuing program of modern highway system development.

The industry has just about 12 months to do a tangible job. February 1961 will find the National Highway Program facing the most critical kind of re-evaluation. The findings of comprehensive BPR studies on economic effects of new highways will be in; the big AASHO Test Road results will have been revealed; and a dozen vitally-affected groups will be at each others' throats.

There will be subtle moves to sabotage the highway construction program entirely, or to reduce it again to a piece-meal existence. If the average citizen does not feel a real desire for safe, modern highways and is not inspired to communicate his sentiments to Washington, Congress will again be without the direction it needs to cut through a maze of conflicting demands. This does not need to happen if the Better Highways Information Committee, backed by the resources of the roadbuilding industry, does its job well.

B.F.Goodrich

Copter hop over the new Niagara

Ride in the Bell Ranger and see how B.F.Goodrich tires help build the world's mightiest power project

SOON THE CHURNING WATERS of the Niagara River will be generating more electrical power than ever—over two million kilowatts, enough to light a city the size of Chicago.

More electricity at lower cost is what we'll get from the $720-million Niagara Power Project, one of the biggest peace-time construction jobs in our history.

Already trucks and other earth-movers have shouldered their loads more than 800,000 times—enough trips to take them ten times around the world.

To cope with the challenges of this and other tasks, Merritt-Chapman & Scott Corporation, largest contractor on the project, uses B.F.Goodrich tires and other products.

NOW WE'RE AT 3,000 FEET. Below us is the entire Niagara Project. At the upper right are the Falls. At upper left, 2½ miles above the Falls, is the Intake Area. Here water will be diverted from the Niagara River into 2 giant covered conduits, each of which is as wide as a 4-lane highway and 5 times higher than the Holland Tunnel. These conduits take the water into the vast Storage Reservoir. From there it moves to the new Niagara Generating Plant, where it plummets down to drive 13 generators. Turn the page and learn how this mammoth job is progressing with the aid of B.F.Goodrich tires.

This B.F.Goodrich report continues ▶

SWOOPING DOWN we come over the conduit area that will carry water from the Niagara River to the new reservoir. Excavations for the 46′-wide covered conduits are 110′ x 50′. The trucks below us, hauling away rocks, are equipped with B.F.Goodrich tires. Altogether, more than 2100 B.F.Goodrich tires—on dump trucks, loaders, graders and other equipment—work 'round the clock, six days a week, rolling over rock-strewn Niagara excavation sites.

See how 2100 B.F.Goodrich tires

B.F.GOODRICH ROCK SERVICE TIRES have run up amazing service records at Niagara—over 5,000 hours in some cases! The new B.F.Goodrich Cut Protected tread compound is outstandingly successful at withstanding cutting and chipping from abrasive Niagara rock. Massive double-chevron Rock Service cleats give extra traction in forward or reverse. And because of the B.F.Goodrich Flex-Rite Nylon cord body, Rock Service tires are almost immune to heat blowouts and flex breaks. Result: you get more original-tread hours of service, more retreadable tires.

TO GIVE CONTRACTORS what they need *when* they need it, B.F.Goodrich built a warehouse near the Niagara project. A complete line of B.F.Goodrich tires is stored, ready for every emergency. At the B.F.Goodrich Tire Service Building on the job site, a crew of trained tire maintenance men works in shifts, 'round the clock.

IT'S AN EMERGENCY, and the B.F.Goodrich Tire Service Man is there. He's trained to handle any type tire on any type equipment. He has at his disposal all the latest power tools, such as hydraulic cranes, pneumatic wrenches, bead jacks. Background: 13 penstocks at Niagara Generating Plant will direct torrents of water into giant turbines. Penstocks are 462 feet long.

are helping men harness Niagara

From the beginning of work on the Niagara Power Project, B.F.Goodrich on-the-scene specialists have helped determine exactly the right B.F.Goodrich product for each particular job. In addition to Rock Service tires (now available in the new Cut Protected compound), B.F.Goodrich Rock Logger, Tractor Grader, All-Purpose, Mud-Snow and Power Express tires are at work.

B.F.Goodrich hose feeds air to machines drilling dynamite holes. B.F.Goodrich rain suits, gloves and footwear protect hundreds of construction workers. B.F.Goodrich conveyor belts will carry materials for 1,300,000 cubic yards of concrete, total required for the entire generating plant. And helping to keep the whole project humming are special B.F.Goodrich maintenance and service facilities—all part of the new B.F.Goodrich Unified Contractor Program.

No matter what your off-the-road job, B.F.Goodrich is ready to serve you, and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Company, Akron 18, Ohio.*

SPECIFY B.F.Goodrich Tubeless or tube-type tires when ordering new equipment.

Smileage!

B.F.Goodrich *off-the-road tires*

. . . for more details circle 310 on enclosed return postal card

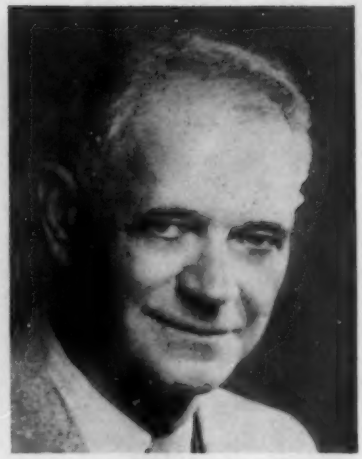
People

CARLOS A. WEBER, chief engineer, Michigan State Highway Department has retired after nearly 40 years with the organization. He has taken a position as vice-president of Scioto Supply Company, a Michigan construction supply firm.

Weber has been a member of the planning and design policies committee of the AASHO and chairman for one year.

RAY DINSMORE has retired from the Washington state highway department after 37 years of duty. His recent position: Assistant director of Highways following service in various other posts including a tenure (1949) as highway director.

Succeeding Dinsmore as assistant director is R. H. Kenyon, recently head of the Division of Plans and Contracts in the department.



Ray Dinsmore

R. H. Kenyon

DAVID D. HENDERSON of Topeka, Kansas, has been appointed division engineer of the National Corrugated Metal Pipe Association, it has been announced by Roy E. Smith, managing director. He will serve drainage product users in Iowa, Missouri, Nebraska and Kansas.

SAMUEL M. CARDONE is the new chief, maintenance operations division, Michigan state highway department. He moves up from head of bridge maintenance. H. J. Rathfoot is chief maintenance engineer.

Continued on page 26

SPREAD 5 TO 40′ AT A FLICK OF THE FINGER WITH NEW HI-WAY MODEL TG SPREADER!

- **Continuously variable dual-hydraulic cab-controls permit driver to instantly regulate width and depth of spread!**

Now, with the new design of the HI-WAY Model TG you can choose any spreading width from 5 to 40′ merely by touching a fast-acting hydraulic control in the cab. A similar control regulates the flow of all material from sand, salt, chips, cinders and calcium chloride to heavy bank sand containing an occasional 2″ stone. This exact control saves time and materials on any job. Waste is further reduced because there is no free-flowing when the auger is stopped. A stabilizer bar keeps the spinner level at all times, regardless of dump body angle. Spreader fits any standard dump body 6′6″ to 8′ wide. The hydraulic drives are powered by low speed, high torque motors. Pump is driven directly off PTO or supply can be taken from the hoist pump. There are no chains, sprockets, gears or mechanical drives to foul up. Means more usable power, fewer parts, minimum maintenance!

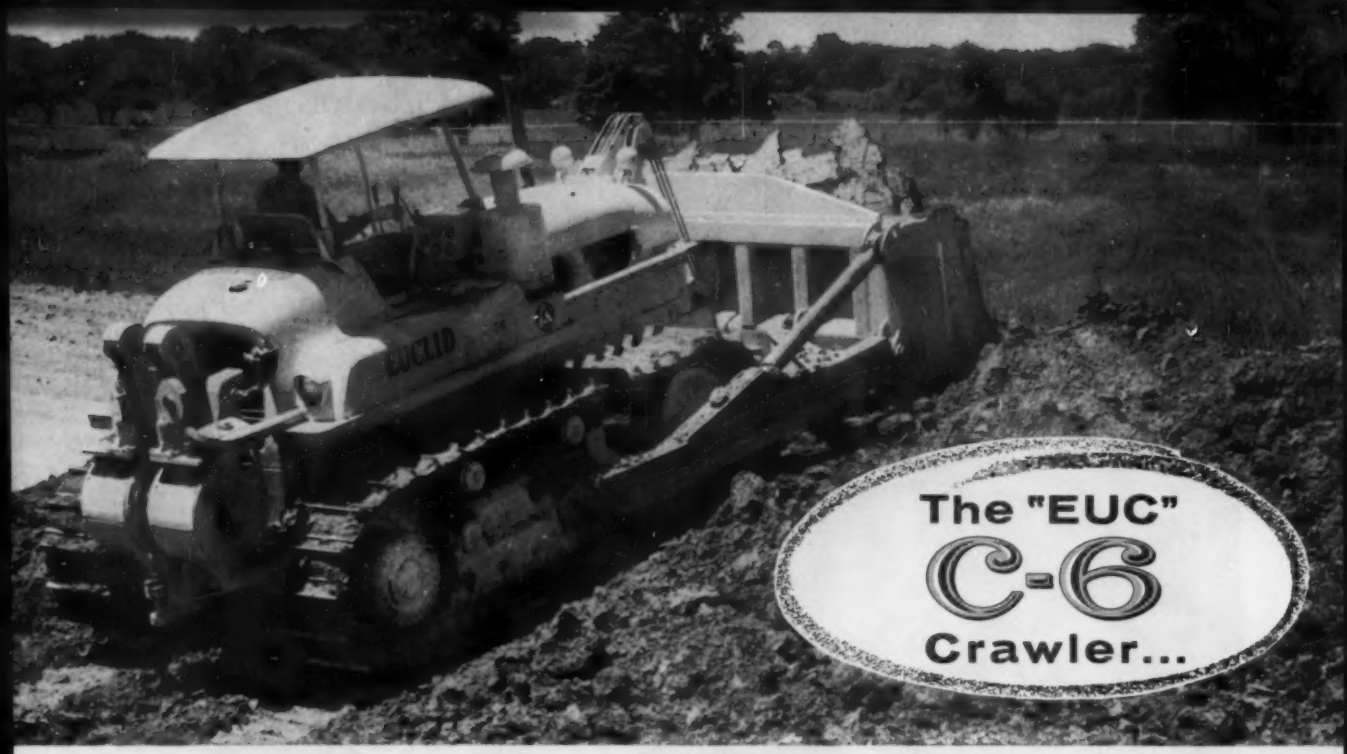
HI-WAY SPREADERS Sales & Service

Protect Today's Motorist Through Better Ice Control

HIGHWAY EQUIPMENT COMPANY

626B "D" Ave. N. W. • Cedar Rapids, Iowa

. . . for more details circle 315 on enclosed return postal card



a brand new 5 year old!

Here are just a few of the many features that put this new C-6 "Euc" years ahead of competitive crawlers:

Proven Torqmatic Drive . . . performance tested and proved in thousands of Euclid earth-movers on the toughest jobs.

Full Power Shift . . . no master clutch . . . easy operation and "fast as a fox" maneuverability that cuts work cycle time.

Fast, Positive Response . . . common steering and braking control, plus Torqmatic Drive for smooth operation on all tractor work.

Better Track Alignment . . . track roller frames are pivot mounted ahead of final drives . . . advanced design of front equalizer bar maintains positive alignment.

Low Maintenance Costs . . . easy accessibility of major components . . . no adjustment of steering clutches and brakes required . . . fewer lube points . . . dry type air cleaner . . . 7 track rollers . . . no tractor weight on final drives . . . recoil system eliminates mechanical springs.

No other Euclid product has ever had the thorough testing—both on proving grounds and on actual jobs—that the C-6 tractor has undergone during the last 5 years. All of the product refinements and improvements resulting from this exhaustive test program, plus Euclid's really new concept of crawler design, make C-6 performance a new standard for comparison in the 200 h.p. tractor class.

Have your Euclid dealer give you the facts and figures on the C-6 . . . compare performance as well as specs with any tractor in its class and you'll see what this new standard of tractor versatility can mean to you in better production and return on investment.

EUCLID Division of General Motors, Cleveland 17, Ohio

. . . for more details circle 312 on enclosed return postal card

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Austin-Western hydraulic crane gently lowers a 3-ton block of concrete into place on flat bed truck.

Austin-Western hydraulic crane does anything . . . goes anywhere on $6,500,000 highway project

"It's fast, mobile and versatile. We use the Austin-Western hydraulic crane to do just about everything on the job," reports Norman J. Maggione, general superintendent and vice president of the Bero Construction Co., Waterloo, N.Y.

Two places at once

Bero's $6,500,000 project, a part of the Niagara section of the New York Thruway calls for six bridges in 1¼ miles. Mr. Maggione says, "We have one A-W crane on the job and wish we had more. Our job is split in sections by railroad yards and city streets. Because of their speed and mobility, the self-propelled, rubber-mounted A-Ws can just about be in two places at once.

"Using the A-W crane has doubled our speed in setting bridge panels. It maneuvers easily among tubular pilings and can turn on a dime. It has plenty of traction and power on any type surface.

Economical to operate, maintain

"We've got lots of economy right along with outstanding job performance. One man on an A-W can often do the work of four. We haven't had any maintenance problems.

"The A-Ws are radio-dispatched. People are always calling for one to get them out of a spot or to speed things up. It's the most versatile piece of equipment on the job!"

Learn more about this Model 210 hydraulic controlled precision crane with 18-ft. telescoping boom and 360° swing, all-wheel drive and steering. Contact your nearby Austin-Western distributor or write us today.

Austin 100th YEAR Western
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON
Power graders • Motor sweepers • Road rollers • Hydraulic cranes
. . . for more details circle 279 on enclosed return postal card

People

Continued from page 24

Robbins to ARBA Contractors Division

Eugene (Gene) Robbins, 34-year-old Houston Chamber of Commerce executive, has joined the Washington staff of the American Road Builders' Association, as managing director of the Contractors Division. He succeeds W. Guy Gunn, who resigned to accept a position with the Associated Pennsylvania Constructors.

Robbins, a graduate of Texas A & M College, has been active in association and promotion work, including the promotion of farm-to-market roads and other rural highways.

Eugene Robbins

JACOB R. SENSIBAR, president, Construction Aggregates Corporation, Chicago, has been elected national president of the American Technion Society. The Society is a nationwide group composed of 15,000 engineers, scientists, technicians and industrialists sponsoring the Technion-Israel Institute of Technology. Sensibar's firm has done dredging in many countries for waterfront parkways, swamp reclamation, canals and other projects.

EARLE C. CLEMENTS, former U.S. Senator and governor, is Kentucky's new commissioner of highways. He takes the post in newly-inaugurated Governor Bert T. Combs' cabinet.

Continued on page 32

In New Trucks or Old—
EATON INDUCTALLOY AXLE SHAFTS

LAST 3 to 10 TIMES LONGER

Through billions of miles of heavy-duty service, Eaton Inductalloy Axle Shafts have proved their ability to deliver superior performance. Freedom from break-down—more time on the road, less time in the shop—plus thousands of trouble-free miles added to axle life, mean lower over-all operating cost.

Eaton's exclusive method of dual hardening truck axle shafts produces an extremely hard case extending deep into the material structure, and enables Inductalloy Axle Shafts to handle more work and abuse without fatigue failure.

Eaton Inductalloy Axle Shafts are available not only in new axle equipment, but also as replacements for earlier models. Ask your truck dealer for complete information.

EATON

AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

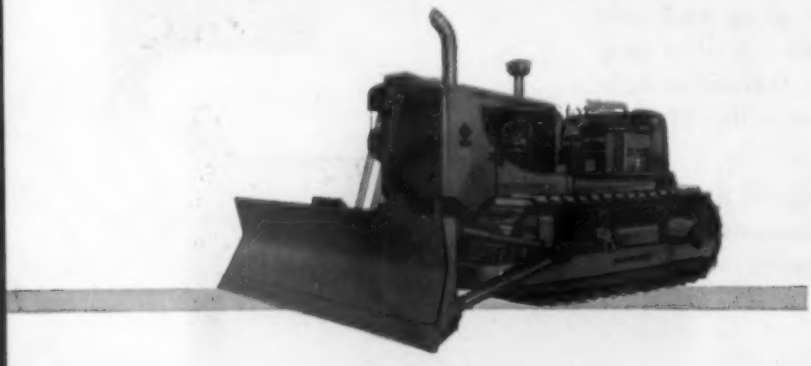
MIGHTY... HEALTHY... POWER

Whether your choice is the 225-hp HD-21 or the 150-hp HD-16, you get from 8½% to 27% more efficient engine operation than from other crawlers.

This fuel-pinching efficiency is a fact! Your Allis-Chalmers dealer will show you actual proof of up to 27% fuel savings in the Allis-Chalmers 16000 or 21000 engines over units of comparable size. He'll tell you why they run cleaner . . . how they "sip" fuel to earn the title "industry's healthiest engines."

Six crater-shaped pistons develop 225 hp in the HD-21, 150 hp in the HD-16 . . . both at an easy 1825 rpm. Coupled with torque converter drive, they provide plenty of rough dozing lugability . . . all the power you'll ever need.

These big Allis-Chalmers tractors are built for mighty tough service. Shock-absorbing all-steel main frame, durable double-reduction final drives, certified permanent lubrication of tapered roller bearing truck wheels, idlers and rollers, and extra tough track keep them going season after season with a minimum of maintenance. Your Allis-Chalmers construction machinery dealer will be glad to show you an HD-21 or HD-16 soon. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

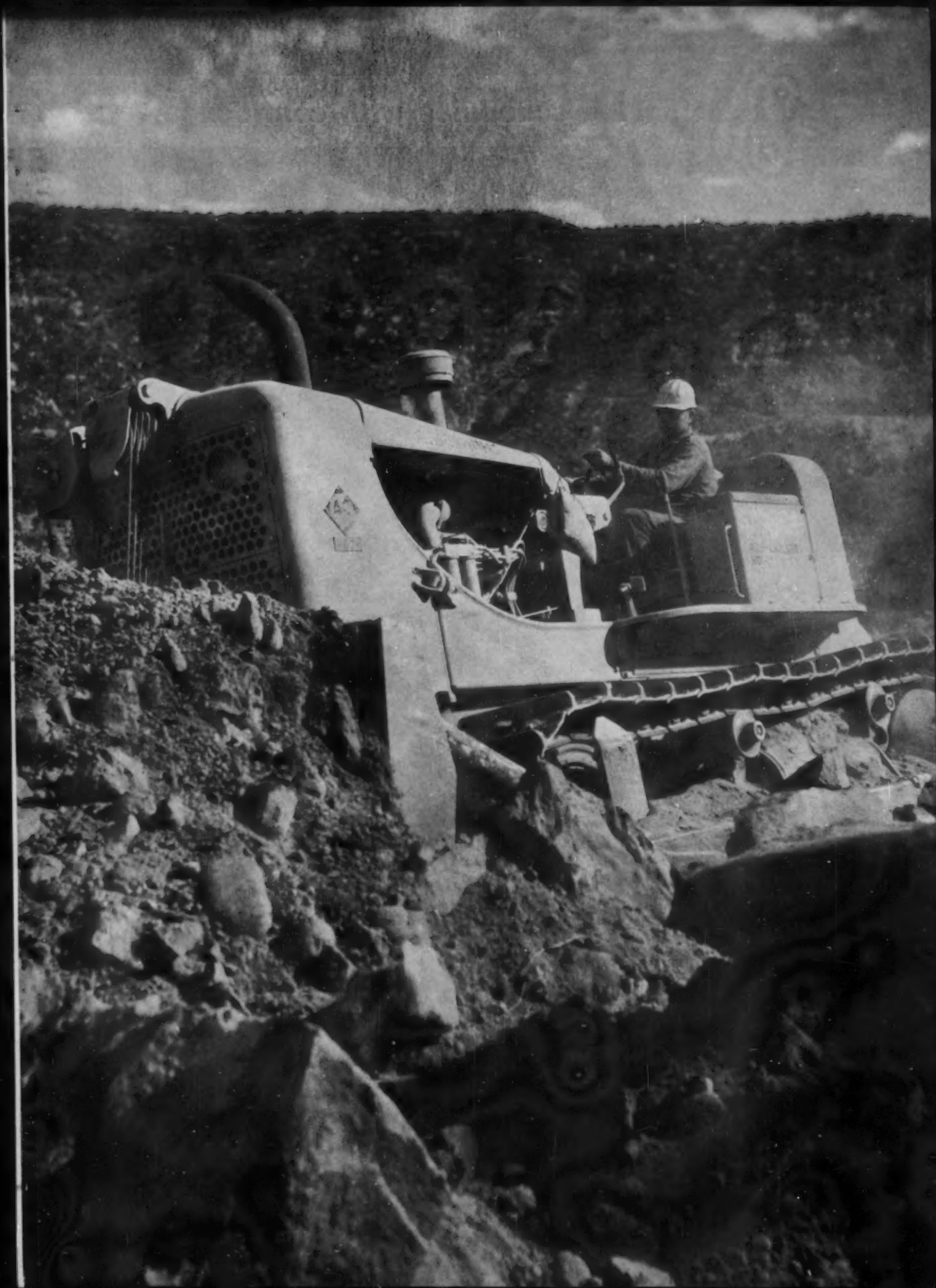


move ahead with

ALLIS-CHALMERS

power for a growing world

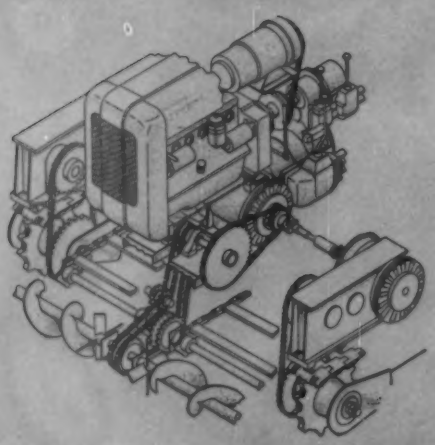
. . . for more details circle 281 on enclosed return postal card



Bid tight paving schedules with confidence

With these two Cedarapids Bituminous Pavers as an integral part of the production team, an Eastern company smashed paving production records by laying 5,050 tons in one day. Working in echelon formation to cover the 27' roadway width, and paving over manhole covers, the Pavers handled the maximum output of three mixing plants and 20 trucks.

Cedarapids Engineered for lowest cost per ton



This is a typical illustration of the simplicity of Cedarapids Paver design which reduces maintenance costs. Note that only 6 chains and 2 V-belts are used on the Cedarapids Paver to reduce the number of wearing parts and mechanical drive linkages required. Other leading pavers have from 12 to 17 chains and from 5 to 10 V-belts to maintain. Other Cedarapids cost-cutting features include: a simple, trouble-free electrical system for all-automatic controls; easy accessibility of all parts; fewer parts for crawler track assembly and self-cleaning features reduce crawler maintenance; powerful magnetic clutches permit instant contact of clutch plates to reduce costly wear; rugged frame construction withstands impact of dumping heavy loads and the stresses of carrying the loads over uneven ground. Ask about the many other features that help reduce downtime.

CEDARAPIDS Bituminous Pavers

Give you more GO time—less downtime

The shorter your paving season, the more important *go* time is. Your profit lies in equipment that *works* all day, every day, with the absolute minimum of downtime.

That's what you get with a Cedarapids Bituminous Paver on the job—steady day-after-day work that reels off the miles of perfect mat, lets you bid low on the tightest schedules with confidence in your ability to get the job done on time and at a nice profit. Owners from all over the country give the same reports:—"Minimum maintenance with the Cedarapids Paver." "No downtime during the working season." "We finished the job ahead of schedule."

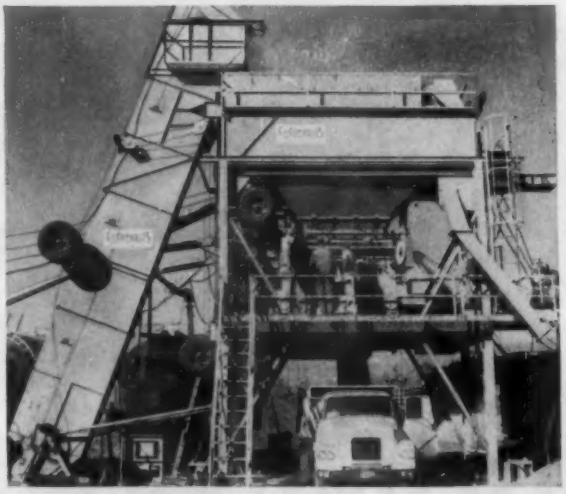
And you get more than low-cost-per-mile paving. You get fast, schedule-trimming speed. The vibrating screed "irons" the mix into a smooth, uniform, high density mat with no voids or tears even at 102 fpm operation. According to all reports, this machine is an operator's dream . . . it's so automatic it almost operates itself.

There are dozens of other profit-benefits engineered into the Cedarapids Bituminous Paver. Be sure to investigate each one and compare with other pavers. Your Cedarapids Dealer will gladly give you all the facts. See him today.

Complete your Paving Package with CEDARAPIDS

Bituminous Mixing Plants

Here's the way to supply your Paver with mix produced at lowest cost per ton. Use the Cedarapids Bituminous Mixing Plant model best suited to your production needs. The complete Cedarapids line includes all-automatic, 100% portable batch type models in sizes up to 7500-lbs; automatic, semi-automatic and manual stack-up models for either stationary or portable installation, in sizes ranging from 1500-lb. to 7500-lb. batches; also available are two sizes of continuous mix plants.



Portable Aggregate Plants

Low-cost aggregate cuts cost per ton on your entire paving project. With the complete line of Cedarapids Portable Aggregate Plants, you can produce aggregate in any quantity to practically every specification. The Cedarapids line includes a profitable variety of different units, ranging from portable primary crushers, intermediate crushing and screening plants, secondary crushing and screening plants, tandem crusher aggregate plants, conveyors, bins, and other production boosting auxiliary equipment.

IOWA MANUFACTURING CO.

Cedar Rapids, Iowa

. . . for more details circle 321 on enclosed return postal card

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

Gentlemen: Please send full information about the Cedarapids Bituminous Paver.

Also send details about the equipment checked below . . .

☐ Bituminous Mixing Plants ☐ Portable Aggregate Plants

☐ Ask your representative to call

Name_____

Company_____

Address_____

City_____ State_____

People

Beavers Honor Construction Leaders

Continued from page 26

Several well-known leaders in the heavy construction industry received 1960 awards for distinguished service to the industry at the recent national meeting of the Beavers. This organization of men and companies in the heavy engineering construction field, numbering 1200 members, met in Los Angeles January 21 for their fifth annual get-together.

With R. W. Rasey of Winston Brothers Construction Company, Minneapolis, presiding as president, the following were given awards: Management: Algot F. Johnson, Al Johnson Construction Company; Walter Scott, Peter Kiewit Sons' Co.; Supervision: Victor G. Hindmarsh, Bechtel Corporation; Engineering: W. J. Leen, U. S. Army Corps of Engineers; Supply: Tim J. Riley, Ingersoll Rand Co., and Special: Raymond A. Wheeler, Lt. General, U. S. Army (ret.).

Continued on page 34

W. J. Leen

Walter Scott

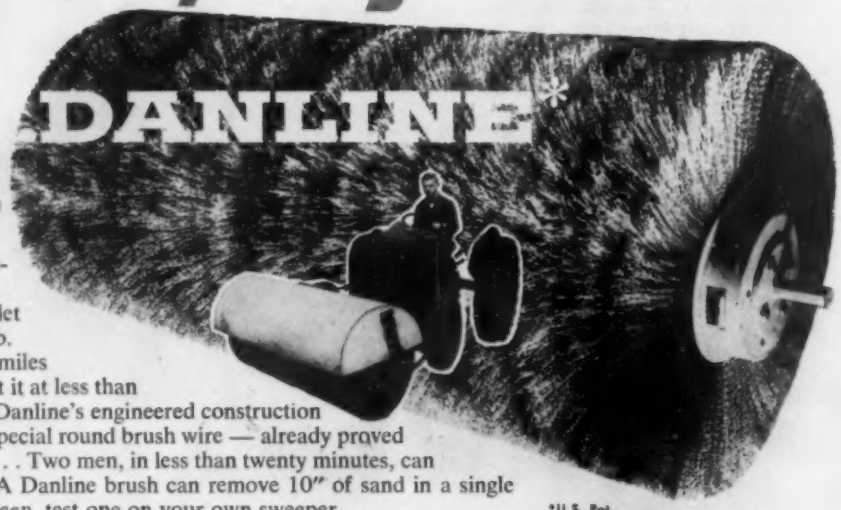
Lt. Gen. Raymond A. Wheeler

Algot F. Johnson

Tim J. Riley

Victor G. Hindmarsh

500 Sweeping Hours From ONE.. Brush



Toss away those old fibre sweeping brooms and replace with a Danline wire brush — once — let your sweepers do a thorough job. You'll get up to 3000 sweeping miles from one Danline, and you'll get it at less than 10 cents per sweeping mile . . . Danline's engineered construction allows rapid assembly — uses special round brush wire — already proved on the toughest industrial jobs . . . Two men, in less than twenty minutes, can easily assemble a Danline . . . A Danline brush can remove 10" of sand in a single pass! . . . *For a really clean sweep,* test one on your own sweeper.

*U.S. Pat. 2864112

Newark Brush Company.

59-2

260 MICHIGAN AVENUE
KENILWORTH, NEW JERSEY

NEWARK

. . . for more details circle 333 on enclosed return postal card

Where heavyweights move job records prove...

FIRESTONES CARRY MORE YARDS PER DOLLAR!

Get Firestone off-the-highway tires and get set to make more money! From planning stage to the finished project a combination of Firestone tires and Firestone Giant Tire Service adds up to bigger profits every time. Every Firestone off-the-highway tire is built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires. You get Firestone S/F (Shock-Fortified) nylon cord bodies to guard against impact damage. A *Firestone Tire Expert* will help you match tires exactly to the job and will handle all of your tire maintenance problems to turn downtime losses into worktime profits! Call your Firestone Dealer or Store today!

Always specify Firestone Tires when ordering new equipment

Super Rock Grip Wide Base (Nylon)* Super Rock Grip Deep Tread*

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1960, The Firestone Tire & Rubber Co.

*Firestone T.M.

. . . for more details circle 305 on enclosed return postal card

Scarifying heavy clay subgrade after application of 5% hydrated lime. Note large clay clods.

IN-PLACE LIME STABILIZATION SAVES EXCAVATION

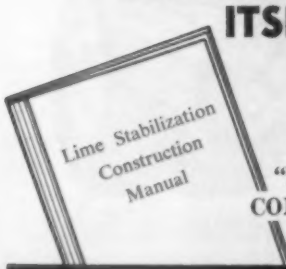
Before lime stabilization, unstable clay subgrade soils often were excavated and replaced with better borrow materials -a costly procedure.

Now, these same unstable clays, having P.I.'s as high as 50, are utilized fully with hydrated lime (3-6%)—at a substantial savings.

WHY? Because lime reduces plasticity and swell, increases strength and stability through a cementing action, and renders the soil relatively impervious to water. Due to these striking improvements, reductions in pavement thickness are justified.

And lime stabilization is permanent, as evidenced by 14 years of successful durability experience. Used in highest types of pavement, including interstate highways and jet bomber bases.

ONLY LIME HAS PROVEN ITSELF WITH HEAVY CLAY SOILS



Write for free booklet, "LIME STABILIZATION CONSTRUCTION MANUAL"

NATIONAL LIME ASSOCIATION

925 15th STREET, N.W., WASHINGTON 5, D. C.

. . . for more details circle 332 on enclosed return postal card

People

Continued from page 32

HARVEY O. GRASSE succeeds Harold L. Plummer as chairman of the Wisconsin highway commission. Plummer retired recently after eight years as chairman.

The new chairman is a dairy farmer and real estate operator. Also new on the commission is V. L. Fiedler a career engineer in state highway work who has moved up to the commission spot after 33 years of service.

Harvey O. Grasse

JOHN COCKRELL, MANAGER OF THE BERLIN HEIGHTS, Ohio highway division operations of the J. A. Jones Construction Co. of Charlotte, North Carolina, has been promoted to assistant vice president.

Mr. Cockrell came with the J. A. Jones Company in 1954 on the Ohio Turnpike before which he was a partner in the W. L. Johnson Construction Co. of Columbus, Ohio.

BEN H. PETTY, 71, Purdue University professor emeritus of highway engineering and one of the nation's leading highway personalities, died January 7. Retiring as professor of highway engineering at Purdue last June, he had received national recognition for his work in highway education and his organization in 1924 of the Purdue Road School.

J. P. MURPHY has been made deputy state highway engineer (engineering), California division of highways. He moves up from assistant state highway engineer (administration), which position he has held since 1957. He is a 30-year employee.

Geared with Fuller ROADRANGER... Three International Model 495 Payscrapers belonging to V. H. & M. Construction Co., Denham Springs, La., handle a total of 4500 to 5000 cu. yds. of material every 10½ hrs. in construction of Interstate Highway I-10 between Jennings and Egan, La.

Faster work cycles boost profits... COUNTERSHAFT BRAKE SPEEDS UPSHIFTS

Longer gear and bearing life with Pressure Filtration and Lubrication

Heavy rainfall and deeply-rutted, wet blue-clay surface have been major obstacles to the work of V. H. & M. Construction Company on a Louisiana highway project. Fighting weather, time and terrain, V. H. & M. handles a total of 4500 to 5000 cu. yds. every 10½ hours with 3 International Model 495 Payscrapers equipped with semi-automatic 9-speed Fuller R-1160 ROADRANGER Transmissions. Standard equipment on the R-1160 includes the Fuller Air-Powered Countershaft Brake and Pressure Lubrication and Oil Filtration System.

E. D. Pinkston, Superintendent, says, "Thanks to our Fuller-equipped Payscrapers, our production is very good despite miserable operating conditions and material which is extremely tough to handle. Our operators like the Fuller countershaft brake. It gives quick, easy upshifts without double clutching, keeps speeds up and cuts cycle time. And the pressure lubrication and filtration system prolongs gear and bearing life."

Ask your dealer about the off-highway Fuller Transmission . . . with countershaft brake and pressure filtration system as standard equipment . . . designed to put more profit in *your* operation.

FULLER TRANSMISSION DIVISION
MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

. . . for more details circle 304 on enclosed return postal card

Here's 7 to 20 Tons of Uniform Compaction—Self-Propelled, Safe, Maneuverable

First pneumatic compactor designed from the ground up as a self-propelled unit!

The STA-BILT 5620 is the *only* pneumatic compactor with front-wheel drive for "straight-down" ground pressure—no creeping, scuffing or shearing. It's the only unit with equal weight distribution on 8 front, 9 rear tires. Maximum overlap of front and rear treads provides even, uniform compaction that more than meets the toughest specs.

It's maneuverable, turns easily in 18 ft — well within road width. It's fast on the job and between jobs, moving at speeds up to 20 mph. Low-slung and safe, it works on slopes as steep as 3-to-1. The operator sits up front, with excellent visibility in all directions.

It's self-powered — your choice of gasoline or diesel. It features torque converter drive plus power shift, with six speeds forward, three reverse.

STA-BILT 5620 . . . in a class by itself!

SEE YOUR DISTRIBUTOR FOR ALL THE FACTS

USE THIS COUPON FOR FREE INFORMATION

SEAMAN-ANDWALL CORPORATION
Milwaukee 1, Wisconsin

Send me more information about the STA-BILT line of soil stabilizing equipment. ☐ I'd also like to have a salesman call.

Name _____ Title _____

Firm _____

Address _____

City _____ State _____

SEAMAN-ANDWALL CORPORATION

A Subsidiary of the American-Marietta Co. • Milwaukee 1, Wisconsin

. . . for more details circle 342 on enclosed return postal card

Publications

THE HIGHWAY AND THE LANDSCAPE. A new book by Dr. W. Brewster Snow, professor of civil and sanitary engineering, Rutgers University Press, Trenton, New Jersey. This "first of its kind" book has chapters written by specialized contributors covering every aspect of relationship between roadside beautification and the highway function.

STATE HIGHWAY ADMINISTRATIVE ORGANIZATIONS; AN ANALYSIS. Special report 51, Highway Research Board, 2101 Constitution, Washington, D. C. Price: $0.80. Represents a revision of a bulletin dated 1952 and representing major updating by the Board's committee on highway organization and administration, Ralph S. Lewis, chairman.

PERFORMANCE AND TESTS OF ASPHALTIC CONCRETE. Bulletin 234, Highway Research Board, 2101 Constitution, Washington, D. C. Price: $0.50.

Two papers presented at the Board's 38th annual meeting: "Relation of Densification to Performance of Small-Scale Asphaltic Concrete Test Sections," by C. T. Metcalf, describes the results of tests on core samples removed after 15 and 43 months of service from sections constructed with several variables in mix design.

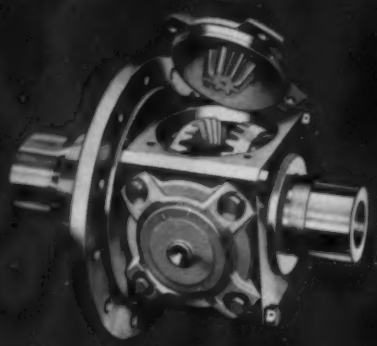
"Use of Marshall Stability Test in Asphalt Paving Mix Design," by C. T. Metcalf, presents equations and design curves relating bearing capacity of asphaltic mixes to the test and flow.

DEVELOPMENT OF CEMENT PERFORMANCE TESTS AND REQUIREMENTS. By H. F. Gonnerman. Research Bulletin 93, Research and Development Laboratories of the Portland Cement Association, 33 W. Grand Avenue, Chicago 10, Illinois.

LIME AND LIME-FLYASH AS SOIL STABILIZERS. Bulletin 231, Highway

Continued on page 42

HYDRAIR*



POWER-TRANSFER
DIFFERENTIAL

How these exclusive advantages

help you cut hauling costs...

DEEP V-BODY

LW **Haulpak®**

These 3 cost-cutting advantages...

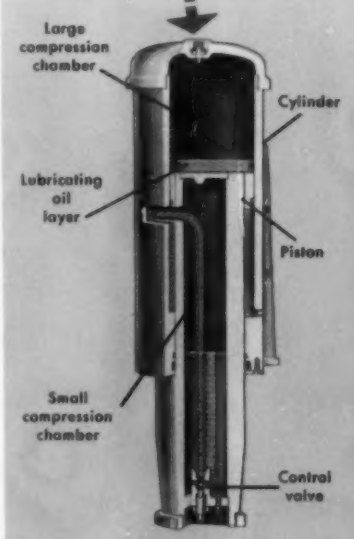
LW HAULPAK
Available in 3 sizes
22, 27 and 32 tons
290, 335 and 375 hp

1 HYDRAIR smooths rough haul roads

On LW Haulpak, you get a sturdy, simple air-hydraulic suspension system that eliminates the costly, time-wasting maintenance and repair of springs. Four Hydrair units cushion against loading and travel shock . . . compensate *automatically* for off-center loading and keep the load riding level over humps and holes.

Other Hydrair benefits:

Located high out of dust, dirt, and moisture, Hydrair cylinders permit higher ground clearance (23″) and sharper turning (Haulpak makes 180° turn in area only 44′6″ wide). The elimination of springs and conventional front axle also reduces non-profitable dead weight.



How this exclusive suspension system works

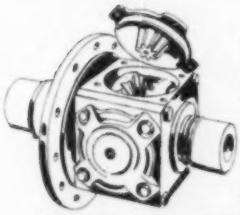
Basically, Hydrair operates like this: The upper compression chamber above the piston supports the load on a cushion of nitrogen gas and the lower compression chamber acts as a rebound chamber to snub the return or downward movement of the piston. The maximum stroke of the piston is 14 inches in the two front suspension units and as much as 7 to 9 inches in the two rear Hydrair units.

Conventional leaf springs have an "action space" of less than 4 inches, so it is easy to judge the tremendous improvement Hydrair represents as far as tire and vehicle life and operator comfort are concerned. Hydrair absorbs and cushions virtually all loading and travel shock, keeping this brutal punishment away from the tires, structure, and operator. Hydrair relieves the pounding on the road surface that creates "washboards".

..yours only in Haulpak

2 POWER-TRANSFER DIFFERENTIAL
pulls load through soft footing

This same exclusive LW differential has boosted production and cut costs for thousands of LW Tournapull® owners for more than 14 years . . . and now, *for the first time*, it is available on a truck. The power-transfer differential *automatically* puts power on the wheel with best traction, so you can haul through soft, slippery spots that bog down conventional haulers. The differential action also reduces wheelspin and tire wear.



The LW Haulpak differential works *automatically* at *all* times, is as simple in construction and as trouble-free as an ordinary differential. When one wheel tends to spin, idler pinions are automatically forced outward against friction surfaces. This slows the slipping wheel, and transfers up to 4 times its tractive effort to wheel on firmer footing. Neither wheel will spin independently until the 4-to-1 ratio is exceeded.

HAULPAK saves you money many other ways:

LESS MAINTENANCE (entire lube-check, needed only at 500-hr intervals, consists of just 3 easy-to-reach grease fittings). *POWER-MISER FAN* (cools with 20 to 25 less hp drain). *FOUR SEPARATE BRAKING SYSTEMS* (for fast stops with complete safety). *POSITIVE POWER STEER* (for faster turning, easier handling). *SIMPLE SIX-GEAR FINAL DRIVE* (compared to 12 or more usually standard). *BIG, ROOMY CAB.*

3 DEEP V-BODY gives you bonus tonnage within short wheelbase

Haulpak's exclusive deep V-body allows you to haul extra tons of material within a short wheelbase. Loaded material quickly fills all corners for big, low-void payloads. Deep "V" also provides a low center of gravity . . . gives Haulpak better stability on turns for high-speed hauling no matter how rugged the road.

In addition, the Haulpak V-body is exceptionally strong. It is constructed of high-tensile-strength steel . . . nearly 3 times stronger than steel commonly used in trucks, yet it weighs ⅓ less. Result: *You haul up to 30% more payload than Haulpak's weight.*

Bonus yardage in every Haulpak load rides in the exclusive V-shaped body. Low loading height (10'1") and large top opening (14'5" x 11") makes it easy for shovel operators to load Haulpak fast, without spillage. Heavy rubber pads provide 100% cushioning of the body against loading and travel shock.

HAULPAK LW 80...

offers new low in hauling costs,

80 tons, 100 yd capacity . . . speeds to 40 mph

Proved in strip mine operations, the 450-hp LW 80 hauls materials at lowest-cost-per-ton. Constructed of light, super-strong steels, Haulpak hauls more than 2 times its weight in payload! It is easier to handle and maneuver than 50-ton units of conventional design. Has many other profitable advantages. *Ask for complete information.*

This 80-ton HAULPAK performs at the Midland Electric Coal Company mine near Farmington, Illinois.

BIGGER PROFITS for you in well maintained haul roads

You can count on fast, low-cost haul-road maintenance when you use powerful heavy-duty LW graders. That's because LW graders work at higher speeds, complete jobs faster. Use them to build and maintain haul roads, level stockpiles and fills, improve drainage. LW graders last longer because of their 100% anti-friction drive and rugged one-piece main-frame. And you'll profit by the big 63-inch blade circle . . . the quick, easy moldboard tilt adjustment . . . rubber engine mounts . . . and full-sweep visibility. Seven models, 67 to 190 horsepower.

See color film "Revolution on Wheels"

In this 15-minute film you will see Haulpaks at work on highway construction, in copper and iron mines, and in rock quarries. You'll see why and how Haulpak moves more tonnage at big savings. Your LW Distributor will be happy to show you this film, "Revolution on Wheels".

Get complete facts on LeTourneau-Westinghouse equipment from your LW Distributor

Your nearby LW Distributor is ready, willing, and completely able to help you solve your hauling problems. He also handles LeTourneau-Westinghouse earthmoving equipment—Tournapulls, rubber-tired tractors, Rear-Dumps—and other lines of proven production tools. He is in a position to give you honest appraisal of trade-in equipment, and can assist you in obtaining helpful financing when it is needed.

See your Distributor, too, for dependable repair service and LW factory parts. You will be pleased with his prompt and efficient attention to your needs. Ask him to check your parts stock, and help arrange a schedule so his service department and yours can work together with greatest efficiency. You'll find your LW Distributor a good man to know. See him soon.

LW

Litho in U.S.A.

L.TOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILL.

HP-2265-G-4

NYGEN-BUILT

GENERAL TIRES

keep your units moving full steam hour after hour . . . job after job . . .

Whether it's sand, mud or the rockiest grade . . . the General Tire keeps rolling to keep projects on schedule. With exclusive Nygen-cord construction, the General Tire defies the worst job hazards while its heavy, husky tread provides traction beyond comparison. You get maximum flotation, minimum rolling resistance, too! That's why the tough-built General Tire keeps going whatever the going! See for yourself on your next job!

THE GENERAL TIRE & RUBBER CO. Akron, O.

. . . for more details circle 313 on enclosed return postal card

SUPERIOR
HIGHWAY
SEALANT
ALLIED
Jet Seal
• 9015H has no flow—even at elevated temperatures (200°F)
• Will prevent penetration of water into joints
• Is highly resistant to highway salts
• Will prevent incorporation of incompressible materials
• Has positive adhesion, cohesion, resilience and ductility at low temperatures (−20°F)
• Is simple to apply, with the exclusive Applicator, originated by Allied.
• Is economical and durable
• Is quick curing at all temperatures—can be opened to all traffic in one hour
ALLIED
MATERIALS CORP.
PRODUCERS, REFINERS AND COMPOUNDERS OF SPECIAL ASPHALT PRODUCTS
ALLIED BUILDING • 5101 N. PENNSYLVANIA • P. O. Box 7103
39th St. Station • Oklahoma City 12, Oklahoma
Plants: Stroud, Okla. • Detroit, Mich. • Los Angeles, Calif.
Write for further details. Product 9015H

. . . for more details circle 276 on enclosed return postal card

Publications

Continued from page 36

Research Board, 2101 Constitution, Washington, D. C. A 91-page bulletin containing six papers given at the 38th Annual Meeting of the Board. Price: $1.60.

FLEXIBLE PAVEMENT DESIGN RESEARCH: 1959. Bulletin 233. Highway Research Board, 2101 Constitution, Washington, D. C. Price: $1.00. 56-page bulletin; three papers presented at the Board's 38th annual meeting.

LAND ACQUISITION: 1959. Bulletin 232, Highway Research Board, 2101 Constitution, Washington, D. C. A 123-page compilation of reports and papers given at the Highway Research Board annual meeting January, 1959. Price: $2.40.

STATE AND LOCAL GOVERNMENT FINANCES, 1942 and 1957. Replacing a previous issue, this statistical reference available from the Bureau of Census, Washington 25, D. C. at 50¢ per copy.

Michigan Starts Taxing Highway Materials

Part of Michigan's new state financing, enacted to end the states' financial crisis, consists of a 3% use tax applying to all materials and supplies purchased by a contractor for incorporation into state trunk highways.

Officials estimate that this tax will represent approximately 1.5 percent of the total contract for a typical road job.

THE 1960 DECADE WILL see a jump in mileage of divided highways in the U.S. from the present 17,000 miles to 70,000 miles by 1970. So forcasts the National Highway Users Conference, which also sees a rise in total motor vehicle travel from the present 575 billion vehicle miles to about 800 billion in the decade.

Depend on EUCLID'S GREATER DIMENSION for lower hauling costs

Model R-27 has rated payload of 54,000 lbs. and a heaped capacity of 26½ yds. . . . available with Cummins 335 h.p. and GM 336 h.p. engine . . . 4-speed Torqmatic Drive with converter lock-up and Torqmatic Brake . . . dual hydraulic booster steering . . . 18.00 x 25 tires on all wheels . . . rugged body with twin hoists . . . top speed with full payload, 34 mph.

Backed by better than 25 years of specialized experience in building off-highway earthmoving equipment exclusively, Euclid's modern rear-dump line incorporates advanced engineering that is a result of unmatched field experience. From the 10-ton Model R-10 to the big 55-ton "Euc" with two engines and a total of 672 h.p., Euclid Rear-Dumps meet today's requirements for big performance.

This greater dimension . . . in a wide range of capacities, in choice of engines, transmissions, tire sizes, and in type of hauler . . . in the parts and service facilities of Euclid's world-wide dealer organization, too . . . can mean lower hauling costs on all kinds of earthmoving jobs.

EUCLID Division of General Motors, Cleveland 17, Ohio
Euclid (Great Britain) Ltd., Lanarkshire, Scotland

A complete line of rear-dumps with payload capacities of 10, 15, 18, 22, 27, 40 and 55 tons . . . also semi-trailer models of 12, 22, 35 and 50-ton capacity.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

. . . for more details circle 314 on enclosed return postal card

Tested and proved at some of America's

Best defense against pavement distress

...plus high skid resistance, too!

GUARDKOTE* 140

Want to cut down pavement maintenance expense in traffic trouble areas? Apply Guardkote 140 on bridges, at approaches to toll booths, ramps, tunnels, intersections, and cloverleafs. Guardkote 140 cuts maintenance costs by arresting spalling, scaling, and polishing.

Guardkote 140 is now giving outstanding service in more than twenty applications under a wide variety of conditions. Most of these applications are *north* of the frost line . . . testifying that Guardkote 140 withstands freeze-thaw cycling.

Guardkote 140 is a new liquid plastic paving cement, based on Epon® resin, which hardens within hours to a tough and flexible material. Its excellent adhesion permits the bonding of grit or aggregate to Portland cement and bituminous concrete, wood or steel substrates to give a skid-resistant protective wearing surface. Because of its low shrinkage, Guardkote 140 also is ideally suited for making durable pothole patches.

Easy to apply, either by hand or with available continuous spray equipment, Guardkote 140 forms a thin, impervious layer that seals concrete paving materials against the ravages of de-icing chemicals and freeze-thaw cycling and prevents rusting out of steel reinforcing material.

Read the list of advantages that Guardkote 140 offers, and you'll agree that it is among the most important new paving materials ever developed—

1. LIGHT WEIGHT—Because Guardkote 140 can be applied in thin layers, it is ideal for surfacing bridges. Gutters, expansion joints, and scuppers do not have to be raised. On new construction, considerable savings in structural design can be realized because provisions for heavier conventional resurfacing materials are not required.

2. FAST CURING—In warm weather Guardkote 140 hardens rapidly, keeping traffic interruption to a minimum—a matter of hours, not days.

3. EASE OF APPLICATION—Depending upon the area, Guardkote 140 can be easily applied in batches—by continuous hand spray or with labor-saving automatic tank truck spray equipment. Hot rolling and complicated form construction are unnecessary.

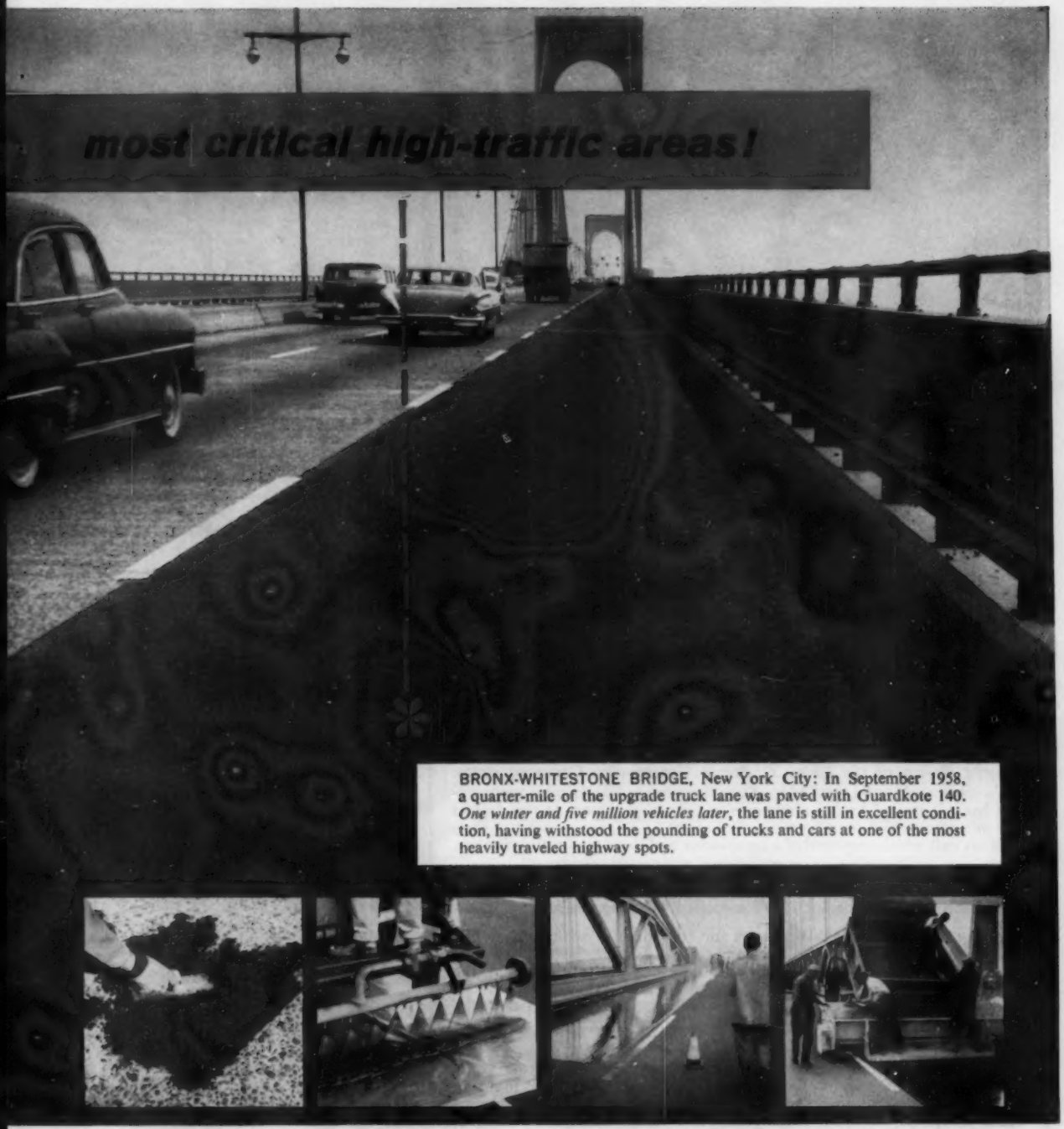
4. SKID-RESISTANT—Sharp grit or aggregate, applied before Guardkote 140 hardens, gives an excellent and long-wearing skid-resistant surface, even when wet or oily.

5. EXCELLENT ADHESION IN VERY THIN LAYERS—A 1/16″ to ⅛″ layer of Guardkote 140 develops bond strengths equal or superior to that of conventional paving materials to which it is applied.

6. UNHARMED BY OIL, GAS AND CHEMICALS—Typical of all Epon resin-based compounds, Guardkote 140 is chemically inert to all solvents and chemicals normally encountered on roadways.

7. LIGHT-COLORED GUARDKOTE 120—For matching the color of concrete, clear Guardkote 120 is available.

*TRADEMARK SHELL CHEMICAL CORPORATION



BRONX-WHITESTONE BRIDGE, New York City: In September 1958, a quarter-mile of the upgrade truck lane was paved with Guardkote 140. *One winter and five million vehicles later*, the lane is still in excellent condition, having withstood the pounding of trucks and cars at one of the most heavily traveled highway spots.

Prior to resurfacing, potholes were patched with Guardkote 140. For color-matching to concrete clear Guardkote 120 also is available.

Continuous distributor truck commences the run by applying Guardkote 140 through spray nozzles.

A quarter-mile strip of Guardkote 140 was applied over both bituminous and Portland cement concrete.

Surfacing grit is applied by conventional means immediately after Guardkote 140 was laid down.

SHELL CHEMICAL COMPANY

PLASTICS AND RESINS DIVISION

Central District
6054 West Touhy Avenue
Chicago 48, Illinois

East Central District
20575 Center Ridge Road
Cleveland 16, Ohio

Eastern District
42-76 Main Street
Flushing 55, New York

Western District
10642 Downey Avenue
Downey, California

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Toronto

SHELL

. . . for more details circle 343 on enclosed return postal card

ESSICK
VIBRATING COMPACTORS

Essick VR-28-W Self-Propelled Vibrating Compactor on Golden State Freeway

COSTS CUT IN HALF . . .
PRODUCTION TRIPLED . . .
SPECIFIED DENSITIES EXCEEDED . . .

ESSICK 28" VIBRATING COMPACTOR OUTPERFORMS OTHER EQUIPMENT ON SOIL OR ASPHALT

Charlie Brown of the Chas. T. Brown Construction Company states:

"We were working on the Golden State Freeway in Los Angeles, compacting backfill around bridge abutments and drainage pipes. At the start of the job, compaction costs were running about $1,300 per month per compaction unit which consisted of a compressor and three pneumatic tampers.

"Having successfully used Essick Vibrating Compactors on other projects, we felt that we could get better densities at less cost in the confined areas of this job with the Essick 28" self-propelled vibrating model.

"We put the Essick VR-28-W to work and cut monthly costs to about $650 per compaction unit (about one-half), tripled our production, and exceeded our best past compaction performance. Being self-propelled, the Essick 28" Vibrating Compactor is just the ticket for backfill operations on soil and in hard-to-get-at locations. It gives the most compaction at the least expense, and exceeds specifications in record time."

Many Contractors are finding that the 865 lb. VR-28-W, with its High Frequency Vibration, exceeds the compaction of a sixteen-ton static roller on soil. This multiple purpose tool has also revolutionized highway maintenance by putting down better asphalt patches at greatly reduced costs. Carrying hooks make it completely mobile, and being self-propelled, it will go just about anywhere compaction is required.

SEE YOUR ESSICK DEALER FOR A DEMONSTRATION

9 Models of Vibrating Compactors from 13" to 72" widths

Also 14 Models of Tandem Rollers from ½ to 14 Tons

ESSICK MANUFACTURING COMPANY

1950 SANTA FE AVENUE
LOS ANGELES 21, CALIFORNIA

850 WOODRUFF LANE
ELIZABETH, NEW JERSEY

Affiliated with THE T. L. SMITH CO., Milwaukee, Wisconsin

. . . for more details circle 299 on enclosed return postal card

Meetings

NATIONAL READY MIXED CONCRETE ASSOCIATION—Annual Convention, Conrad Hilton Hotel, Chicago, Ill.; February 15-19.

NATIONAL SAND & GRAVEL ASSOCIATION—Convention and Exposition, Conrad Hilton Hotel and Coliseum, Chicago, Ill.; February 15-19.

NATIONAL CRUSHED STONE ASSOCIATION—Annual Convention and Exposition, Conrad Hilton Hotel, Chicago, Ill.; February 21-25.

AGC KENTUCKY HIGHWAY DIVISION—Annual Meeting, Kentucky Hotel, Louisville, Ky.; February 26-27.

GEORGIA HIGHWAY CONTRACTORS ASSOCIATION—Annual Convention, Oglethorpe Hotel, Savannah, Ga.; February 28-29—March 1.

VIRGINIA AGC—Annual Meeting, Homestead Hotel, Hot Springs, Va.; February 28-March 2.

COLLEGE OF THE PACIFIC, School of Engineering—3rd Annual Highway Conference, Stockton, California; March 1-3.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Spring Meeting, New Orleans, La.; March 7-11.

WISCONSIN ROAD BUILDERS ASSOCIATION—Annual Meeting and Convention, Schroeder Hotel, Milwaukee, Wis., March 14-16.

AMERICAN CONCRETE INSTITUTE—56th Annual Meeting, Commodore Hotel, New York City; March 14-17.

MISSISSIPPI VALLEY CONFERENCE OF STATE HIGHWAY DEPARTMENTS—Edgewater Beach Hotel, Chicago; March 16-17.

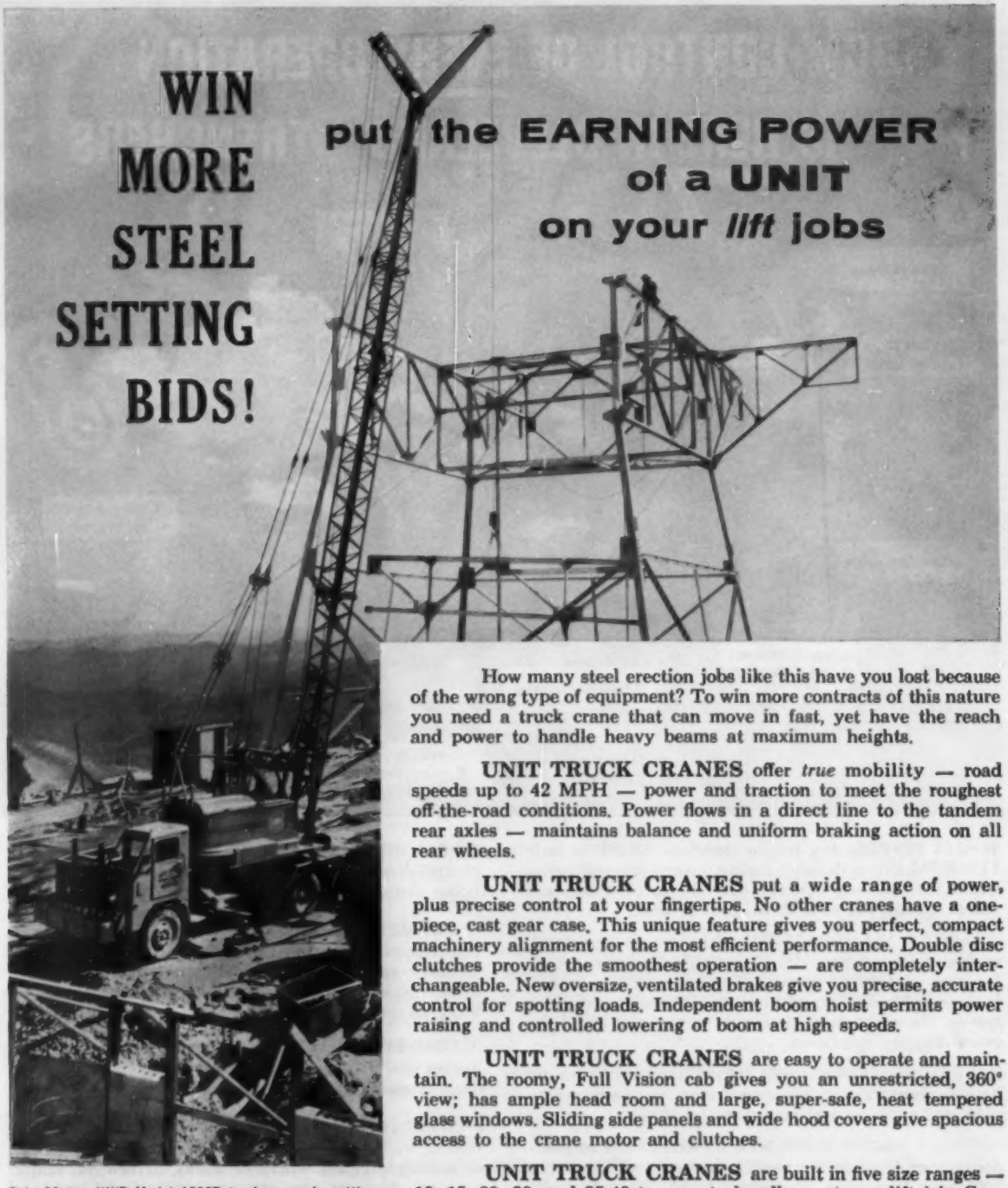
ASSOCIATED GENERAL CONTRACTORS OF AMERICA—41st Annual Convention, Masonic Memorial Temple, Fairmont, Mark Hopkins and supporting hotels, San Francisco, Calif.; March 21-24.

MARYLAND HIGHWAY CONTRACTORS ASSOCIATION—Spring Meeting, Baltimore, Md., April 21.

ALMOST 500 OKLAHOMA STATE HIGHWAY bridges are being posted for loads of 2 to 15 tons, and the state highway patrol is instructed not to issue overweight or oversize permits to cross them.

WIN MORE STEEL SETTING BIDS!

put the EARNING POWER of a UNIT on your *lift* jobs



This 20 ton UNIT Model 1520T truck crane is setting steel for a power line atop Mt. Frances in Utah.

How many steel erection jobs like this have you lost because of the wrong type of equipment? To win more contracts of this nature you need a truck crane that can move in fast, yet have the reach and power to handle heavy beams at maximum heights.

UNIT TRUCK CRANES offer *true* mobility — road speeds up to 42 MPH — power and traction to meet the roughest off-the-road conditions. Power flows in a direct line to the tandem rear axles — maintains balance and uniform braking action on all rear wheels.

UNIT TRUCK CRANES put a wide range of power, plus precise control at your fingertips. No other cranes have a one-piece, cast gear case. This unique feature gives you perfect, compact machinery alignment for the most efficient performance. Double disc clutches provide the smoothest operation — are completely interchangeable. New oversize, ventilated brakes give you precise, accurate control for spotting loads. Independent boom hoist permits power raising and controlled lowering of boom at high speeds.

UNIT TRUCK CRANES are easy to operate and maintain. The roomy, Full Vision cab gives you an unrestricted, 360° view; has ample head room and large, super-safe, heat tempered glass windows. Sliding side panels and wide hood covers give spacious access to the crane motor and clutches.

UNIT TRUCK CRANES are built in five size ranges — 10, 15, 20, 30, and 35-40 tons — to handle most any lift job. Convertibility to all excavator applications brings you a plus value. Your UNIT dealer has full information on every model — and the famous UNIT crawler-mounted machines, too. Call him soon.

SHOVELS	½ to ¾ YDS.
HOES	½ to ¾ YDS.
CRANES	5½ to 40 TONS
DRAGLINES	½ to ¾ YDS.

UNIT

CRANE & SHOVEL CORP.

6407 W. Burnham St.
Milwaukee 19, Wis.

. . . for more details circle 350 on enclosed return postal card

100% CONTROL OF EVERY OPERATION IS HERE IN CLEVELAND J TRENCHERS

WHEEL SPEEDS: big engine develops 50 HP at only 1250 RPM, drives through main transmission to digging wheel differential; operator has choice of 4 forward wheel speeds, 1¼ to 8 RPM, plus reverse.

CRAWLER TRANSMISSION: this famous Cleveland-exclusive feature provides 12 individual crawler speeds for *each* of 4 wheel speeds, allows operator to choose, from over 30 *usable* combinations of wheel and crawler speeds, the *right* combination of power and speed for every digging condition.

HYDRAULIC STEERING: big 16" x 3" internal hydraulic brakes, controlled by suspended-type foot pedals, provide easy steering and maneuvering of the...

WORLD'S FINEST TRENCHER CRAWLERS: a tremendously long-lived, stable, trouble-free, easy rolling track; 1000-hour lubricated, it employs double-flanged wheels rollers and sprockets with teeth widely spaced, drives on each end of 1½-inch hardened crawler pins.

BOOM HOIST: two easy-acting levers independently control raising and lowering each end of digging wheel boom through full height and depth range.

V CONVEYOR SPEED AND DIRECTION: dual, independent, pulley-enclosed hydraulic drives give operator instant control of conveyor belt speed and direction of discharge, eliminate need of conveyor chains, sprockets, hung-on motors, etc.

V CONVEYOR POSITIONING: operator shifts conveyor hydraulically from side to side, placing spoil wherever desired while digging past trees, poles, etc.

HYDRAULIC CRUMBING SHOE: operator controls raising and lowering of shoe, as required, for lifting or setting digging wheel at walks, driveways, underground obstructions, etc.—an exclusive Cleveland feature which makes crumbing practical even in obstruction-crowded digging.

Get the complete story on Cleveland J Trenchers from your distributor

Good Everywhere

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

. . . for more details circle 292 on enclosed return postal card

Getting Roads Well Built Still the Fundamental

Highway engineering today is a term which covers an ever widening range of subject matter. The highway administrator and engineer are having to give an increasingly large part of their time to broad matters ranging from planning, finance and economic studies, down to such things as public relations and personnel.

Lest we forget, the final responsibility of the highway engineer and the entire highway agency is to provide an economic road bed—one that will survive the elements, withstand traffic wear, and give the desired service at lowest annual cost and with maximum safety and convenience.

It is significant that the delegates from 52 countries who attended the 11th International Highway Congress, held recently at Rio de Janeiro, focused strongly on the world-wide problem of getting economic highway construction. Policy statements on thickness design led the list of practical subjects outlined as guides for engineers engaged in the expanding highway effort in every country on every continent.

The fact is, in the tropical jungle, remote desert, mountain highlands, and black-dirt valleys, anywhere in the world, the chief problem is to apply the science of logistics to the use of available soils, aggregates, and paving and stabilization materials.

Anybody can build a road at a price. The real accomplishment of the engineer is to design a road that is neither excessively costly nor under built. This accomplishment is not realized until the contractor has done his work. All the hundreds of technical papers given this winter, at such meetings as the Highway Research Board's, are of little avail if the technical advance fails to show up in efficient, honest workmanship out there in the sun and dust. Practical judgment coupled with the best that technology can offer must be constantly focused on the physical roadbuilding effort.

This is in further explanation—if one were needed—of the decision of this publication's editors to focus strongly on the problem of getting quality construction in the highway program. Comments on this subject will be welcome from readers on the articles carried in current and forthcoming issues.

Harold J. McKeever

Leverage of the push tractor blade pressing down on the rear shelf, plus that exerted by the hydraulic mechanism of the front tractor, adds up to a new dimension in ripping using this single giant tooth.

Rescue by Ripping

New ripping techniques are shattering old concepts. A leading exponent and analyst discusses how to exploit this profit tool.

By Kenneth F. Park
Earthmoving Consultant, San Leandro, California

During the year just past, substantial improvements continued to be made in the machinery, techniques and potential profits of mechanical rock breakage.

In shattering all precedents and concepts by plowing into and through heretofore impregnable rock area, the present-day tractor-ripper group opens a new field of application.

With the undeniable economy of ripping, where possible, there is little question of the contractor's choice of methods if he is well informed. The answer: rip where possible—drill and shoot when necessary.

How is a contractor to know at what point he must choose between blasting and ripping? The proper choice depends upon several conditions:

1. What is the contractor's experience? His resistance, or aggressiveness, toward acceptance and application of new ideas and action? His willingness to attempt the untried?

It is much more likely that he will underrate the potentials of ripping and turn to shooting if a particularly difficult rock situation develops. Generally there is enough cushion in rock prices to assure a profit, so if there is a close decision to make, it is likely the inexperienced operator will avoid ripping. By such a compromise, the higher-than-average profit resulting from ripping will be overlooked.

2. What are the job necessities? Restrictions may make ripping a requisite, in which case it must be done even in spite of inefficiency or mis-application. The obvious thing to do in such a case is to secure the best equipment, outfit it suitably and use it properly.

The most modern ripping tools and techniques will provide *eight or ten times* as much workpower as our early tractor-ripper combinations, so must not be overlooked. Even if the contract does not read "no shooting", the possibilities of ripping must not be passed up. There is too much potentially to be gained by its use.

3. The contractor may feel that he knows little about ripping, but does know shooting.

The one is an infallible means, even if poorly done. The other, in contrast, is an unknown which, unless handled properly, could end in defeat and loss. The decision to shoot may reduce profits to a

This is a "No. 1, No. 1" combination with a 4¾-inch tooth—rated at 73%. This job was bid for shooting their "subbed" to this tractor operator. Note the fine breakage for scraper work.

minimum, compared with a chance to create greater than normal gains by ripping.

Consideration of the costs involved must be in terms of the price of produced work per cubic yard, not the hourly cost of the machine which must necessarily be high. It is necessary to have both accurate machinery costs and accurate rates of accomplishment. Judgments based on inadequate supporting evidence may deflect the otherwise profitable use of the ripping idea, so it behooves the excavating contractor, today, to acquaint himself with all the latest methods and costs.

4. Objections have been raised that the production rate is poor in hard going considering the equipment.

It is true that the more difficult ripping becomes, the lower the production. The same is true, however, with drilling and shooting. Ripping generally pre-supposes use of scrapers for excavating and hauling. Shooting generally means shovels and trucks. The production rate of ripping in good going is much higher than that produced by drilling and shooting, and as high in extremely difficult work.

If ripping is impossible, it is still feasible to drill and shoot for scraper handling. The method calls for closer holes and about twice the powder to provide well shattered material, however. At any rate, drilling and shooting produce material slowly in terms of overall yardage and hours consumed to obtain it.

It is sometimes felt that ripping is in a poor application if it produces as little as 200 cu. yd. an hour. If there is a willingness to accept as little yardage an hour as that produced by a drilling and shooting spread followed by a shovel and truck group, itself, with no more hourly potential, there should be no criticism of rippers.

The thing to do is to arrange excavation so that areas requiring no ripping can readily be moved onto, until those needing it are prepared, then move back. The mobility of scrapers today makes this procedure practical. Another means of providing shattered material is to rip for two shifts and haul for one.

The high rate of scraper production today has made the contractor forget the old days when a single shovel with trucks would only produce as much in an hour as does one scraper now. So jobs must be planned differently. In any case, the relative over-all cost of one operation as opposed to the other should be considered—a ripper-scraper spread compared to a shooting-shovel-truck-spread group. It will be found that anything contributing to the end use of scrapers should be encouraged.

Ripping in itself is such an economical process that even should it cost three times as much as it does—the end cost by scraper handling would often justify the means.

Are machine costs high? Users who first tried today's advanced ripping methods, such as the tandem idea, have indeed cried, "high machinery costs." The only figures with which they could compare costs were those of smaller tractors with 30 percent less workpower. It is like comparing a Shetland to a draft horse. Big tractors are more expensive to own and operate, but look at what they will do! Compare costs of the relative yardages produced and the big tractor will take its rightful place in the sun.

Very careful studies of repair costs on tractors used exclusively on ripping, show no recognizable special wear except in the track assembly and for rare special failures. By track assembly we mean rollers, idlers, sprockets, tracks (rails, pins, bushings and grousers), and labor.

If the normal wear period for this assembly is established on machines not used for ripping, then any shortening of the replacement period in a machine used for ripping exclusively is attributable to that extra work. The cost of ripping with such a machine then can be accurately set up. There are parts that have a longer life than others, but the replacement of the whole is based upon the life expectancy of the quickest to wear out.

Continued on page 95

Omitted Income vs Loss of Profits

By James P. apRoberts
Cost Control Specialist and Industrial Engineer
La Canada, California

The first article of this series November 1959 ROADS AND STREETS was intended to serve as an introduction to the general subject of cost controls as they apply to the typical average-sized roadbuilder. By way of a practical assist, some pointers were offered on how to get a cooperative attitude towards starting the use of more effective cost controls within such an organization, and thus developing a more practical interest in them.

A guinea pig for illustrating some of the situations which can occur in connection with cost control problems was created in the form of the mythical medium sized firm of "U & I Roadbuilders, Inc.". Thus, should any one following this series be interested in having some particular cost control problem discussed, it will be possible to let "U & I" get in and anonymously offer a way to handle the situation. By this same method, we may also get another chance to realize the common nature of so many of our problems.

In the previous article a typical Cost Control Program was introduced or "sold". This was done by getting all of the people connected with "U & I"'s administration interested in trying to develop ways and means of studying and controlling those costs with which they were connected or acquainted. Evidence of such an interest would of course be shown by the answers to a questionaire covering the main functions of cost controls.

At this point we can resume our discussion of constructive cost controls. This we do by considering a summary of the answers given by the key employees of "U & I" to the question of what they considered to be their company's sources of income.

Since "U & I" is a typical roadbuilding firm, it will follow that what is to be discussed in this article regarding income also applies to other construction firms. Therefore, references to this mythical company will be omitted for the balance of this article.

A curious contradictory situation has been found in many construction companies. Management is very frequently and generally rightly concerned over eliminating unnecessary 'job' *expenses*, yet less obvious but often more expensive omissions in *income* are permitted to continue indefinitely.

By way of explaining what is meant by omissions in income or 'overlooked income', let us begin with a brief examination of the general subject of the sources of a typical contractor's income. The following outlines of 'primary' and 'secondary' sources of income cover the basic groups. These outlines do not indicate specific types of construction work such as bridges, airports or roads but only offer a general breakdown. With them in mind we shall then point out several places where it is possible for the contractor to increase his income and profits while reducing his costs.

Primary Income

Sources:

1. Agreement with 'Owner'
   a. Written
   b. Oral
2. Agreement with 'Prime' contractor
   a. Written
   b. Oral followed by written confirmation
   c. Oral

Definition:

1. Specifications covering
   a. Items of work or extent of project
   b. Quantity of work
   c. Quality of work

Continued on page 108

Good teamwork by the crane operators as they set 4-foot-wide hollow-box prestressed beams. →

Economic Package:

Seven Prestressed Bridges in One Contract

Contractor awarded structures on basis of prestressed concrete design submitted as alternate.

Seven prestressed concrete highway bridges just completed in Pennsylvania are pointed to by the designers as demonstrating the versatility and economy of this material.

The bridges, built for the Pennsylvania department of highways, are on a relocated segment of U.S. Highways 11 and 15, a federal aid project near Duncannon, Pa. All the structures are on a 5-mile section of dual highway. They were opened to traffic on October 15, 1959, about 30 percent ahead of schedule. The bridges were originally designed for composite steel and concrete deck. Specifications permitted contractors to submit alternate bids.

The contract was awarded to C. J. Langenfelder & Son, Inc., of Baltimore, Md., on his low bid for a prestressed concrete design drawn by the consulting engineering firm, Macomber & Faber of Harrisburg. The additional engineering cost of preparing the alternate design including superstructure and modification of original superstructure detail, was included in the prestressed concrete bid. Prestressed box beams and composite deck were used in the alternate design to obtain minimum depth-to-span ratio. The design was approved after successful full-scale dynamic and static load tests of a 70-ft. long composite concrete member carried out at Lehigh University. The tests were sponsored by the Pennsylvania department of highways and the Bureau of Public Roads.

Production of the 308 prestressed concrete beams required for the approved design was subcontracted to the American-Marietta Company by Langenfelder. These beams were produced chiefly at the Pottstown, Pa., casting yard of American-Marietta and hauled approximately 95 miles to the bridge site. Hauling by trailer and dolly was done by Lyons Steel Erecting & Rigging Company of Trenton, N.J., under subcontract from Langenfelder. Some girders were cast by Pennsylvania Prestress and by Schuylkill Products, Inc., under arrangements with American-Marietta.

The beams were of varying length and more than two-thirds of them were 4-ft. wide and 42-in. deep. This dimensional standardization expedited casting operations and permitted a faster delivery schedule of beams to the bridge sites. Use of box section beams made it unnecessary to build forms for placing the deck concrete.

The longer members weighed an average of 38 tons; the shortest about 13 tons. Two cranes at the

McCARRICK BROS. INC.
CRANE RENTALS
NORRISTOWN PA.
BR 2-4231

How beams were positioned in chord fashion on curve for Bridge No. 4. Note reinforcing for tying beams integrally with the poured concrete wearing surface.

bridge sites lifted beams directly from the trailer to final position. Site delivery was made at an average rate of 12 units per day.

Prestressing strands of ⅜ in. diameter were supplied by American Steel & Wire Company and John Roebling's Sons Corporation. Design based on 6,000 psi concrete at 28 days, 250,000 psi min. strand strength (ultimate), 175,000 psi initial prestress (14,000 lb. per ⅜-in. strand).

Most beams are seated on neoprene pads which accommodate rotation of the ends of the beams due to deflection or expansion and contraction resulting from thermal changes. The pads used on three of the bridges are 1¼-in. thick and 1-in. on the other structures. Graphite impregnated asbestos pads of ¼" thickness were also used on smaller spans.

In addition to the 308 beams which were precast, five precast pier caps 48 in. wide x 50 in. deep and 64 ft. long were required for one of the bridges. These were cast at the site and post-tensioned with Stresssteel rods supplied by the Stresssteel Corporation. The final design was checked by T. Y. Lin of the University of California.

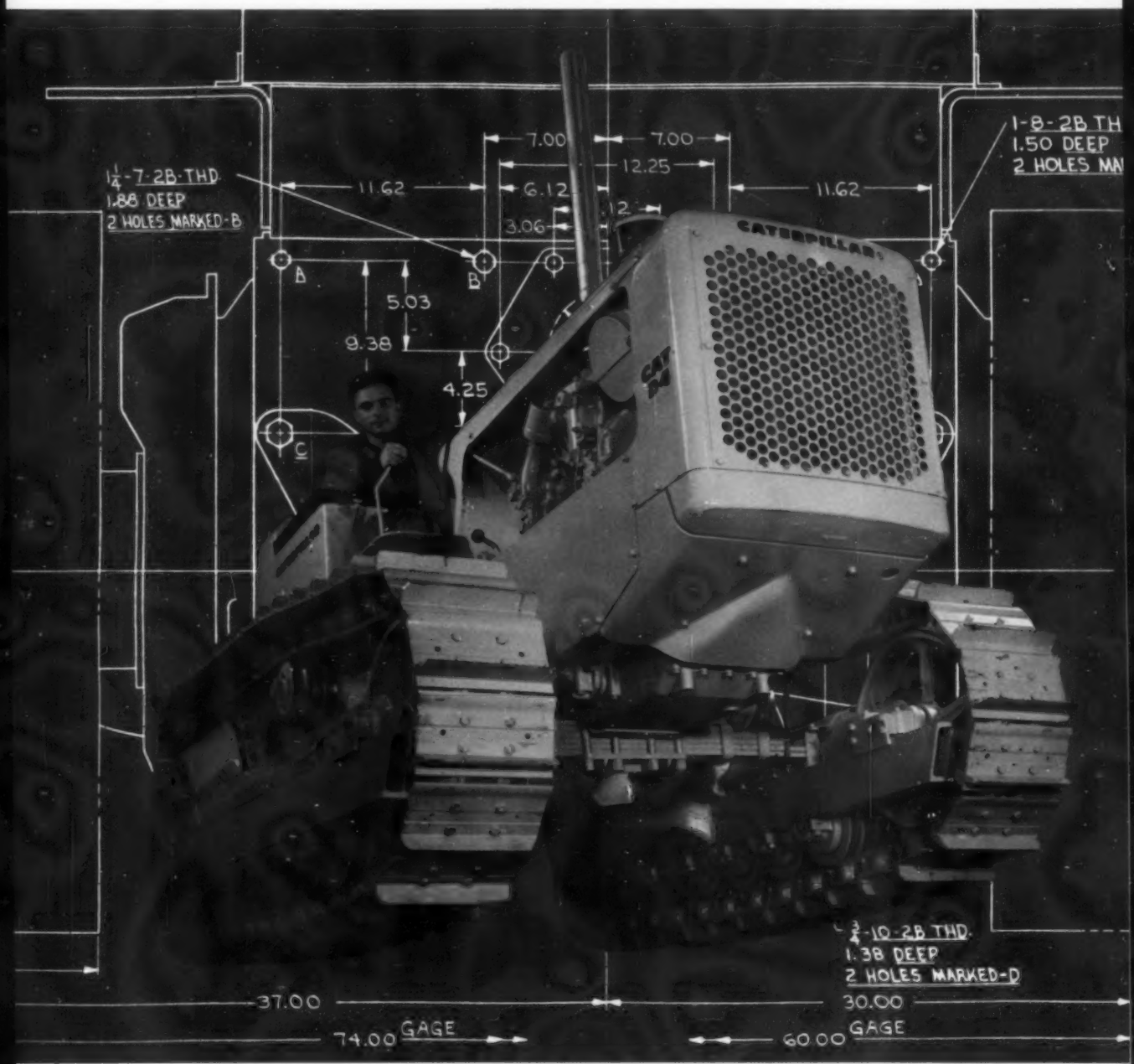
All the bridges were designed for H20-S16 loading. Specifications called for minimum cement content of 7 bags per cu. yd. and maximum slump of 3 in. Actual cement content used by the American Marietta Company for the beams was 8½ bags. Bridge beams were designed for 28-day strength of 6,000 psi. The composite deck was designed for 3,000 psi. A concrete wearing surface for the deck was placed after beams were erected. Projecting stirrups cast in the box beams formed a mechanical connection between beams and the wearing surface.

All the beams were set side by side. Transverse tie rods through the members were tightened by hand wrenches. This insured lateral load distribution by action through shear keys. These keys (see sketch) were packed with very dry grout. Polyethylene curing covers

Continued on page 112

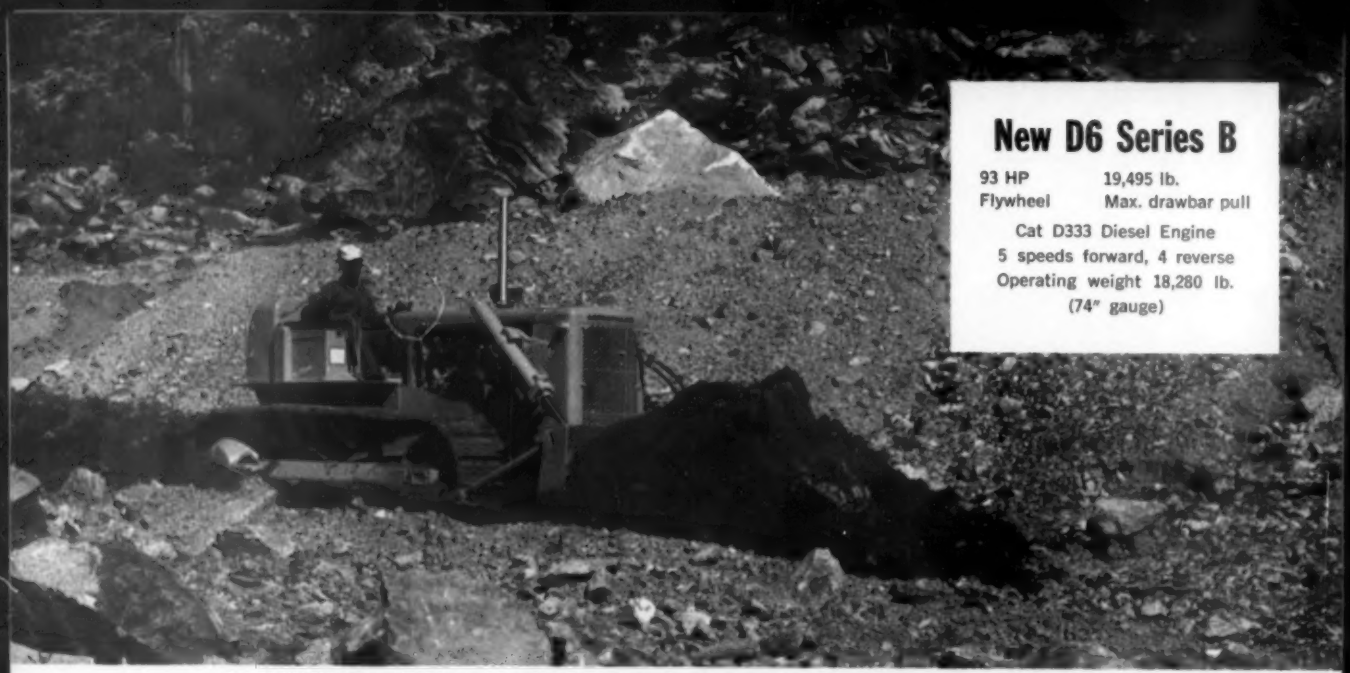
CATERPILLAR ANNOUNCES

2 NEW TRACTORS



D4 Series C · D6 Series B

completely redesigned to boost production and lower costs

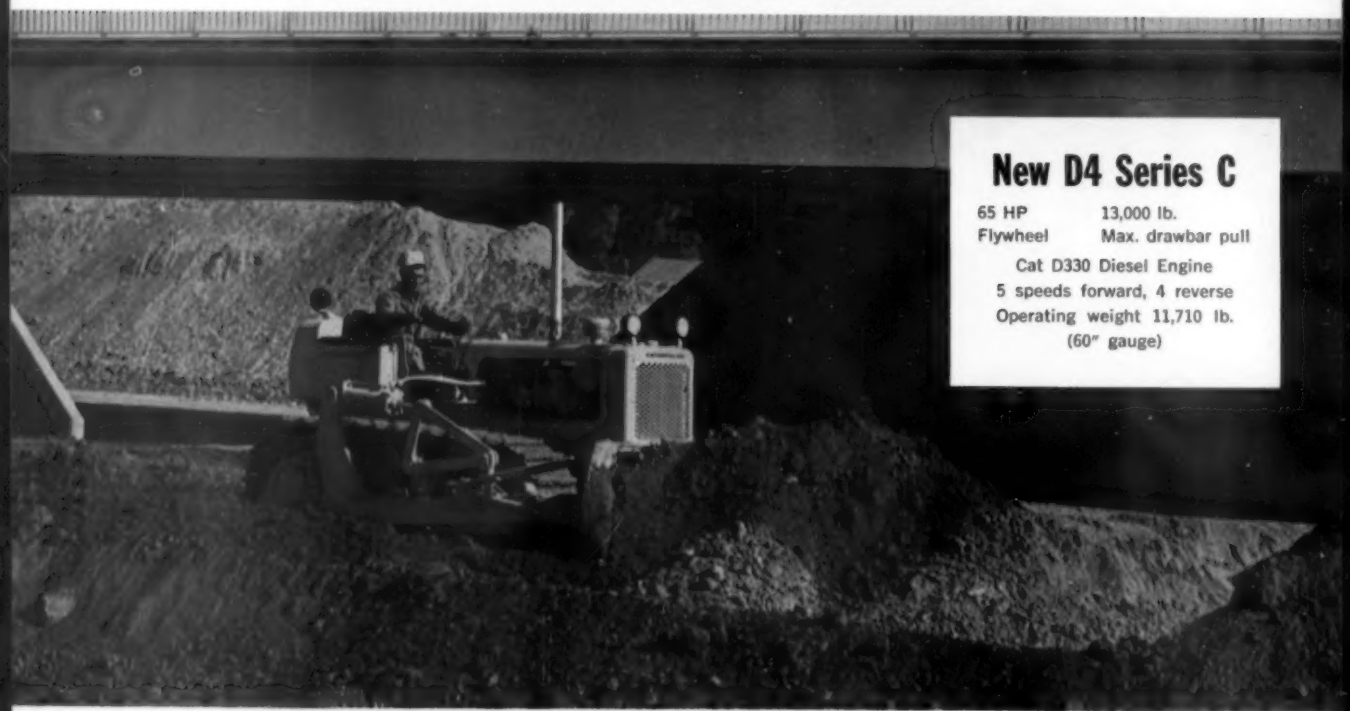


New D6 Series B

93 HP Flywheel — 19,495 lb. Max. drawbar pull

Cat D333 Diesel Engine
5 speeds forward, 4 reverse
Operating weight 18,280 lb.
(74" gauge)

ATTACHMENTS for the D6 and D4, individually designed to match the capacities of each machine, include Bulldozers, Tool Bar, Rock Rakes, Winches, K/G Blade, Back Rippers and many others.



New D4 Series C

65 HP Flywheel — 13,000 lb. Max. drawbar pull

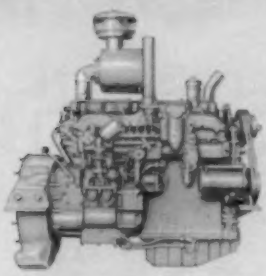
Cat D330 Diesel Engine
5 speeds forward, 4 reverse
Operating weight 11,710 lb.
(60" gauge)

STARTING EQUIPMENT for both tractors includes an improved starting engine with recoil starter for fast starts. 12-volt in-seat starting for starting engine available. 24-volt direct electric starting for diesel optional.

NEW D6 Series B and D4 Series C Tractors...

They look different—they are different. Look them over and see for yourself the advances Caterpillar has built into the new work-styled D6 Series B and new D4 Series C Tractors. Each, in its own class, answers your need for new high production, new operating

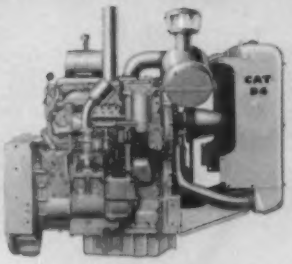
New compact Caterpillar Diesel Engines deliver 25% more lugging ability



D6 powered by 93 HP 6-cylinder Engine

Maximum drawbar pull, 19,495 lb. Provides power with dependability built in for a long life of economical, efficient operation.

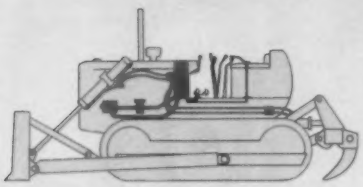
Here's power for even bigger jobs for the D6 and the D4—two completely new Cat Diesel Engines. Each is specifically designed for the tractor it serves. Yet each has certain basic characteristics in common. For example: 25% more lugging ability . . . new compactness, with new ruggedness . . . famous Cat fuel injection pumps in new, easily serviceable housings . . . the reliable Cat precombustion chamber design that delivers maximum horsepower on heavy, economy-type fuels . . . a new direct-acting governor that makes quick fuel adjustments, picks up loads fast . . . a new improved gasoline starting engine with recoil starter for fast starts in any weather—many others!



D4 powered by 65 HP 4-cylinder Engine

Maximum drawbar pull, 13,000 lb. New design results in a smooth, vibration-free performance through all speed ranges.

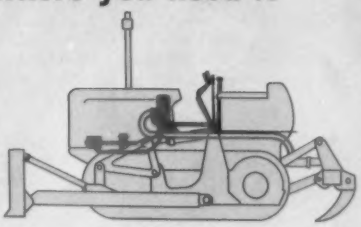
New integral hydraulic systems put more power where you need it



D6 Integral Hydraulic System

No. 165 Hydraulic Control for Bulldozer, 54 GPM – 1500 PSI
No. 143 Hydraulic Control for No. 6 Tool Bar, 29 GPM – 1700 PSI

More work power at the tools—you'll find that's one of the big advantages of these new Cat hydraulic systems. Under-the-hood mounting of tank, pump and valves permits convenient routing of hydraulic lines to bulldozer or implement cylinders, frees front and rear end for optional equipment. Center-pivoted cylinder mounting on the D6 gives increased blade lift/drop range for increased production. Hydraulic control system provides hand control for bulldozer and/or ripper, foot control for tilt cylinder. A choice of three hydraulic circuits gives you complete flexibility to meet all needs. You also have a wide choice of tools to make both tractors even bigger earners.



D4 Integral Hydraulic System

No. 143 Hydraulic Control with:
29 GPM Pump – 1700 PSI for Bulldozers
17 GPM Pump – 1700 PSI for Tool Bars

New operator convenience and comfort in co-ordinated compartments

D6 operator's compartment

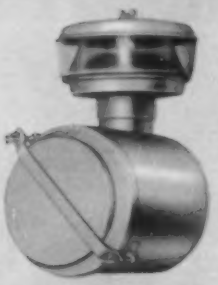
Look what's happened to the operator's compartments in the D6 and D4! Both are all new and completely restyled. The controls are co-ordinated to make one motion flow into the next one. They reduce hand movements and speed every operation. The forward-reverse lever is located next to the operator's right hand to quicken 'dozer cycle times. The transmission speed selector is only inches away. The governor control is high and clear, extending from the new streamlined, quick-vision dash. Boosters for steering clutches provide muscle-saving operation. And the comfortable, high-placed seat allows full view of tools for faster, more accurate work.

D4 operator's compartment

better than ever with new work-producing features!

economy and new earning capacity. Each is completely redesigned to lick the tough challenge of today's fast-paced jobs. Some of their new features are described here. Notice how they complement performance-tested features to make these modern, heavy-duty rigs better than ever. See your Caterpillar Dealer for complete facts about them and their matching equipment. He'll gladly demonstrate on your job.

More features that put the new D6 and new D4 out front in production and economy!

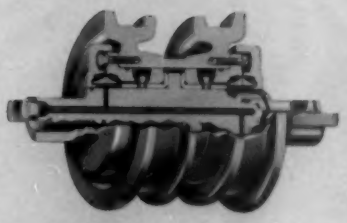


Dry-type air cleaner

Most efficient air cleaner ever developed. Removes 99.8% of all dirt from intake air during every service hour, even in the dustiest conditions. Can be serviced in five minutes. Cuts maintenance time (by as much as 75%) and eliminates all oil costs. This modern-design oil cleaner is new in both the D6 and D4.

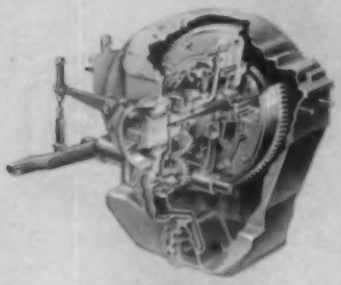
Hydraulic track adjusters

Another on-the-job timesaver developed by Caterpillar. An ordinary grease gun is all that's needed to assure proper track tension. Just open the inspection door and apply a few strokes. The hydraulic cylinder does the rest automatically. Job-tested, hydraulic track adjusters are optional on both the D6 and D4.



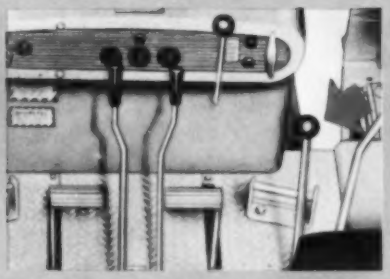
Lifetime lubricated track rollers

That's right – lifetime! Proved by more than five years' testing. Exclusive floating ring seals protect rollers and idlers – keep oil in, dirt out. No lubrication or greasing at all required until rebuilding. Help you roll up profits instead of repair bills. This long-life feature is new in both the D6 and D4.



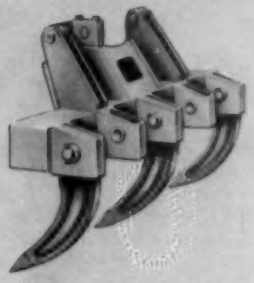
Oil clutch

The most advanced clutch design in the industry – a Caterpillar exclusive. Provides up to 2,000 hours' service without adjustment, the equivalent of about 13 months' "adjustment-free" operation. Virtually eliminates down time for clutch repair. Retained on the D6. Optional on the D4.



Forward-reverse lever

Retained on the D6, this lever is new on the D4 – **an exclusive feature in its class** – and puts the D4 way ahead of the rest in fast 'dozing cycles. Next to the operator's right hand, and only inches away from the transmission speed selector, it lets you change direction quickly and easily.



Matched equipment

You can multiply the profitable uses of both the D6 and D4 with rugged matched equipment. Built to specifications for each tractor, there are Straight and Angling Bulldozers, Rippers, Tool Bars, Rock Rakes, Winches, Bulldozer-mounted Back Rippers, K/G Blades and other tools. Hydraulic or Cable Controls.

ARE YOU GETTING ALL THE PROFIT?

Now is the time to take careful stock of your equipment —to make sure it's earning you all the profit to which you are entitled. All too often, profits slip away because a tractor that appears to be paying its way is actually not delivering the way it should.

A veteran tractor, for example, may be holding down a key job. Repair costs are low. On the face of it, the tractor seems to return a decent profit. But in reality—that tractor could be losing as much as it earns.

Machines have improved a lot in recent years—and Caterpillar has set the pace all along the line. Consider the new D6 Series B and new D4 Series C Tractors. In terms of work, both of these rugged units can do a lot more—not only mechanically—but from the standpoint of greatly increased operator efficiency. A comparison of your existing equipment with these work-styled machines might easily prove a new tractor would increase your output and profits far more than you imagine.

Ask your Caterpillar Dealer to demonstrate the giant strides represented by these two new tractors. Investigate the complete line of attachments that double and triple their usefulness to you. See for yourself how the new D6 and new D4 can help you earn *all* the profit you should on your jobs!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

BORN OF RESEARCH
PROVED IN THE FIELD

"Rescue" grader: an Austin-Western 99 with big Harmo tires.

Balloon Tired Graders Do It

In deep swamp around Curtis, in Michigan's Upper Peninsula bush country, Mario J. Calcaterra, president of the Straits Construction Company, Sault Ste. Marie, used motor graders recently to haul out crawler tractors mired in the muck.

The graders that could go where crawler tractors gave up were four-wheel-drive Austin-Western 99s, mounted with Marmo WB-22 flotation tires. The terrain was a series of swamps along new highway 15 bordering South Manistique Lake. Fine sugar sand, used for the fill, added to the difficulties.

Using a conventional-tired grader with crawler assistance, Calcaterra bogged down and could not maintain his grading schedule. After remounting with flotation tires, Calcaterra had no further trouble and finished his section of the project ahead of schedule.

On another job, in Indiana: Big airplane tires on this Cat 12 grader, enabled it to spread pure sand for shoulder base on the new South Bend bypass. Good traction, and an accurate strike-off despite the fluffy material. Rieth-Riley Construction Co.

Management Ideas for Smaller Contractors

Attractive modern headquarters office building of Berry Construction Company, with tall radiotelephone mast considered a vital part of the management.

'Keep Flexible', Creed of 3rd Generation Earthmovers

Highway contracting firms of the medium size gain success generally by following a few proved principles: stay in your own bidding league; specialize, and get a lot of "sub" work, perhaps; confine yourself to a limited geographical area.

Many add their own refinements to such policy rules. One such is Berry Construction Company of Decatur, Illinois, a highway builder in central Illinois for four decades. Their special amendments:

- Stress sound planning, but take some gambles when warranted.
- Take advantage of all money-making opportunities along the way.
- Blend the ambition of youth with the experience and wisdom of older heads (three generations are represented actively in Berry management, with a fourth coming up).

The Berry company takes some bridge contracts, also sewers, water mains and the like, but their main effort is in grading work. In 1959 the company grossed about $3 million on eight jobs.

Patriarch of the clan—and one whose highway experience goes back to the days of mule trains and the old elevating graders—is James C. Berry, 75. His son, Eldon, is president of the construction company and Eldon's sons, Dick and Gerry, are vice presidents, job superintendents and overseers of the company operation along with their father. Dick and Gerry have fourth-generation sons who are now playing with toy scrapers and will be putting on their heavy shoes in a few summers.

An example of the Berry company's operation was a 7-mile relocation job on US 36 between Decatur and Springfield. The work, a subcontract for $716,272 from McDougal-Hartmann Co., Peoria, comprised grading plus underground

An example of good flagmen control of scrapers crossing a highway on edge of Decatur. Part of a "positive" good will program of Berry Construction Co. that has paid off among local citizens.

A pair of the firm's Allis-Chalmers TS-260 scrapers which teamed up with HD16 dozers to help handle wet soil.

work including culverts, sewers and water main relocations. Route 36 is being rebuilt to a 4-lane divided highway to Interstate standards but not part of the "I" system. Bridges have been subbed to J. L. Simmons Co., Inc., Decatur.

Berry's work on this contract involved 650,000 cu. yd. of roadway excavation and 26,000 cu. yd. of borrow. The company during the past summer graded first on the east end of the section—which projects into the city limits of Decatur—in conjunction with some new bridge construction. The equipment then was moved out to the west end and the contract's major grading was begun there, working in toward the city from west to east.

Most of the work at the "Decatur" end of the job was in Fairview Park, a rolling, city-owned recreation area. With sizable cuts here, the original plan was to bring this yardage out to the western sectors as fill. But Berry vetoed this and decided to buy borrow pits along the route to cut down the length of haul trips. Thus they observed a basic principle in grading—save hauls and make more money.

Acquisition of the three or four borrow areas desired proved another story. The property owners had been affronted during their dealings with the right-of-way people and the young Berry brothers found a cool audience to their proposition. Dick and Gerry gained their objectives, however, by a positive approach, telling the owners what the firm could do *for* them. To one property owner, they offered to dig out the streets for a subdivision development he was planning; with another they arranged to excavate a lake he had always wanted.

The material in these pits was generally good clay usable as fill.

Tightly-controlled PM schedules enable Berry Construction Co. to bear par on downtime—a definite bidding advantage often.

This contractor cooperates all the way with state engineers and city officials in handling traffic safely through its jobs.

The soil of Macon County is free of rocks, and the only bad spots encountered by scrapers on this job were pockets of loamy material which were cut in at the edges and then by-passed.

A rainy 1959 autumn was much more efficient, though, in derailing the Berry timetable. Three-inch rainfalls on two successive October Saturdays, for example, shut down all grading work for many days.

The above problems, and others, brought energetic response from the Berry boys. Another instance:

A power line of the local utility company ran down the center of the new Route 36 right-of-way in Fairview Park. Since this was in a heavily wooded area, the power company was groping for a practical means to get their towers removed before grading began and the new ones erected paralleling the new highway.

The Berry's, who also were interested in getting rid of the old towers, offered to speed the construction of the haul road to match the pace of the power company. As the haul road progressed, the utility people erected new towers along a cleared margin of the haul path. Farther back, as the contractor's stripping crews worked along the right-of-way, other utility men stayed with them, dismantling the old towers and placing the parts along the haul road for pick-up.

Dick Berry says, "We don't mind being unorthodox; in fact we will take work that other contractors are a little afraid of. This job, for example, was a 'stage work' job and a number of our competitors looked the other way at bidding time."

What Dick was referring to was the rather spotty scheduling necessitated on the Route 36 job. One example:

Since the work was started at the east end, it would have been more normal procedure to work out as far west as practicable before moving equipment to the other end—especially since there was a quantity of borrow material available in Fairview Park. This was ruled out, however, because further grading in this vicinity had to wait for relocation of a railroad grade separation.

The Berry organization, medium sized and mobile, is keyed for this type of work. The plan decided on was to pick up and go out to the other end, then send back a detachment of equipment when the railroad work was done.

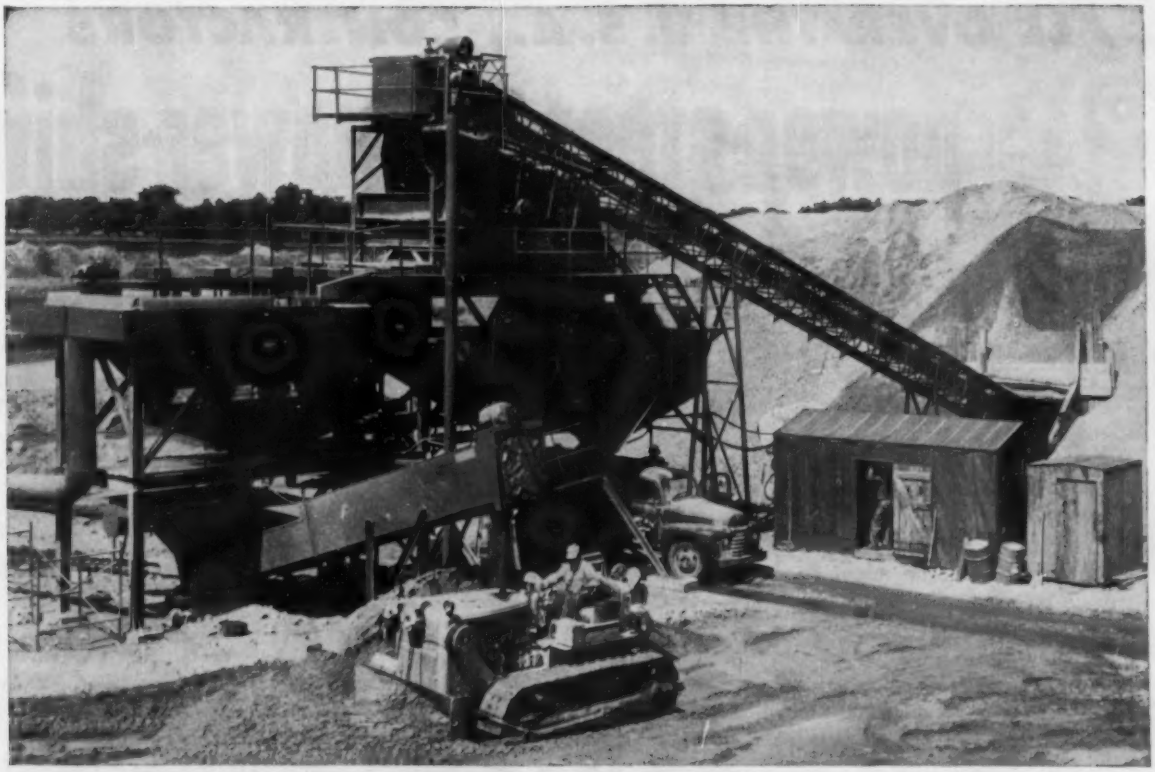
The Berry eye for detail also falls on every circumstance where extra money can be made—or saved. Items:

- With added borrow areas obtained, much of the cut material from Fairview Park would have been nominated as waste. However the Berry company learned that, for the safety of park users, a levee was planned along the new Route 36 through the park. The company contracted to build this levee with the material it cut out of the park right-of-way.

- The expense of handling the formidable amount of timber which had to be stripped was an early cause for concern. An arrangement was made with a local sawmill, however, which firm bought all the footage, sawed up the logs on the spot and hauled them away.

- Broken concrete from streets was sold to the city of Decatur which used it as rip-rap on the shore of Lake Decatur south of the city.

MICHIGAN NOW HAS OVER 350 miles of limited access expressway, with the completion of recent projects. The longest continuous section is a 45-mile segment of Interstate 94 (U.S. 12 relocation).



NEW Pioneer *Hydro-Screen* Washing Plants are easily adapted to changing pit conditions and product requirements. Unitized to be transportable in sections

Now...What's *your* aggregates washing problem?

● Whatever your problem, you may very well find that PIONEER has already designed and field-tested *your* answer . . . in one of its brand new family of *Hydro-Screen* Washing Plants!

Planned for growth as your business increases, there are many models to meet many needs . . . yet each is easily evolved from a simple basic design.

For example, Model 506-WT (shown above) has a 5′ x 12′ vibrating *Hydro-Screen*, a 10′ x 20′ Water Scalping Tank and a 36″ x 25′ Single Screw Classifier. It has a rated capacity of from 160 to 240 tph. Similar models with smaller or larger components for lesser or greater capacity are also available.

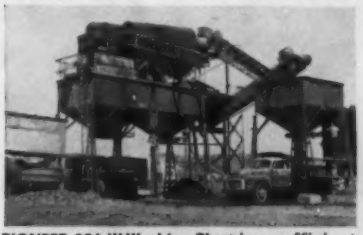
To meet other needs, there are other models, some without a Scalping Tank, others including a Revolving Scrubber. And, to any of these models you can easily add a Buzzer Screen for producing a fifth product, or Stockpiling Conveyors to augment or replace the bins.

What's more, any of these components can be added to a basic plant as your need arises. Not even structural members are wasted.

Unique new heart of these remarkably adaptable, all-electric Plants is the PIONEER *Hydro-Screen*, which cascades material through high-pressure water sprays to wash it specification-clean.

In fact, the *Hydro-Screen* combination of 1) *spray bars on all 3 decks*, 2) the *step-deck* design of the second deck, and 3) the *circle throw* of the inclined vibrating screen is so effective that screening capacity is 2½ to 3½ times greater than of a dry screen.

For all the facts on PIONEER *Hydro-Screen* Washing Plants, see your nearest PIONEER Distributor listed below.



PIONEER 306-W Washing Plant is an efficient semi-portable Plant with built-in scrubber, revolving screens, and screw classifier, complete and ready to go. Later, if you wish, you can add crushers, stockpiling conveyors, and other screening and sizing units. Rated capacity is from 50 to 75 tons per hour.

PIONEER 405-W Washing Plant has giant capacity in dirty materials. Can produce up to 2 different sizes of sand, 5 sizes of stone simultaneously . . . at production rates up to 200 tph. Secret of high capacity is big revolving scrubber working with inclined 4′ x 20′ tandem vibrating screen.

Free Handbook

For your free copy of *Facts And Figures* (the most complete and comprehensive handbook for the aggregates-producing industry), write to PIONEER ENGINEERING, Minneapolis 14, Minnesota, or contact your Pioneer Distributor.

Pioneer®
ENGINEERING
DIVISION OF POOR & COMPANY, INC.

. . . for more details circle 337 on enclosed return postal card

ALL OVER THE U.S.A., CONTRACTORS

power-steer and power-shift

NO ATTACHMENT! NO AFTER-THOUGHT! NO "STOP-GAP"!

Exclusive, years'-proven combined Planet Power-steering and Hi-Lo power-shifting are designed-in, built-in, basic standard equipment of the new 230-hp International TD-25!

Simplified TD-25 design is the only planetary system engineered and located to give you the dual advantages of "live track" steering and on-the-go shifting!

"Live track" Planet Power-steering eliminates load-limiting "dead-track drag"—gives power to pull full loads on turns, as well as on straight-aways. On-the-go, Hi-Lo power-shifting does away with time-wasting "gear-shift lag"—lets you match power to load instantly for full-speed cycles!

No wonder the new TD-25 can outearn king-sized clutch-steered crawlers up to 50%—on push-loading; land-clearing; overburden removal; benching; "mass-production" dozing; ripping; other tough jobs!

New TD-25 seven-roller tracks are strength matched to the full effort of the new 230-hp diesel engine. The "25" is platformed on super-rugged double-box beam frames—and is smoothly carried on International's dual-protected Dura-Rollers, the track rollers that make 1,000-hr lube intervals practical!

Power-shift and power-steer the "25" with king-sized loads—around curves, upgrade, anywhere. Compare the advantages of getting this exclusive performance, and getting it from years'-proven standard equipment. Prove what's behind the "25's" rapid rise to nationwide contractor acceptance. Let your International Construction Equipment Distributor demonstrate!

Though "out-rated" 105-hp by a king-sized, clutch-steered competitor, this nimble TD-25 proves able to outwork "the big one"—side-casting and benching to build Pacific Northwest mountain logging roads!

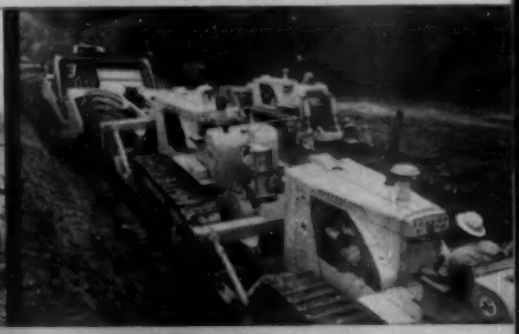
International® Construction Equipment

International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

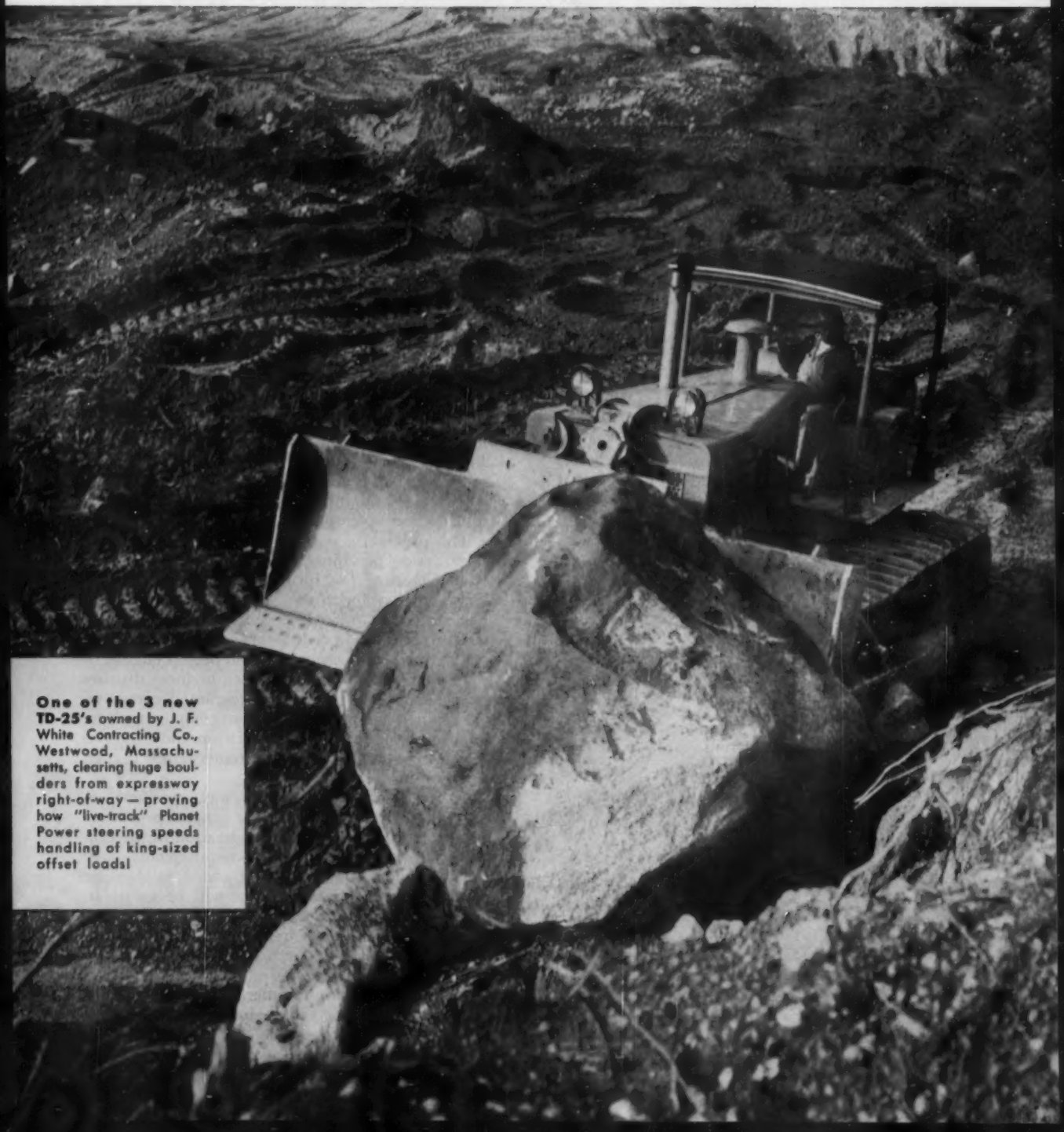
Three new International TD-25's of contractor V. E. Posey's fleet team up to prepare homesites from a mountainside—near San Diego, California. Dual-valving of the "25's" direct-start DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated performance, from sea level to timberline!

Cleaning the face of a Missouri strip mine behind a big dragline, this TD-25 pushes "tractor-sized" boulders aside with the greatest of ease. This "25" also builds dragline walkways and haul roads—and drastically cuts land-clearing costs for Peabody Coal Co.



For cycle-speeding push-loading, TD-25 power-shifting helps give "feather-touch" contact; maintains solid push-block contact on curves; gives gear-higher kick-outs than ordinary. The two "25's" tandem pushing the International 295 Payscraper®, and the third one ripping, belong to superhighway contractor Ed Bentley, Sylacauga, Alabama.

with TD-25 standard equipment!

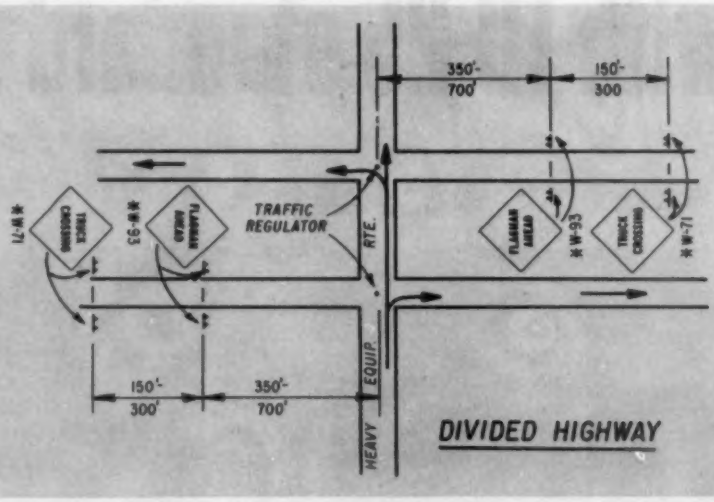


One of the 3 new TD-25's owned by J. F. White Contracting Co., Westwood, Massachusetts, clearing huge boulders from expressway right-of-way — proving how "live-track" Planet Power steering speeds handling of king-sized offset loads!

Equipment Crossing, Traffic Maintained

(From standard plan sheet 18 in 21-sheet set of traffic control schemes)

This sign plan is not to preclude provision of special or additional traffic control devices as approved by the District Traffic Engineer.
Signs indicated with an asterisk (*) and design reference number are part-time signs, when required to protect traffic and the work. Where signs are deemed unnecessary by the Engineer, they must be covered, removed or turned away from traffic.



Michigan Launches Construction Safety Program

By E. D. Suino
Safety Engineer, Michigan State Highway Department

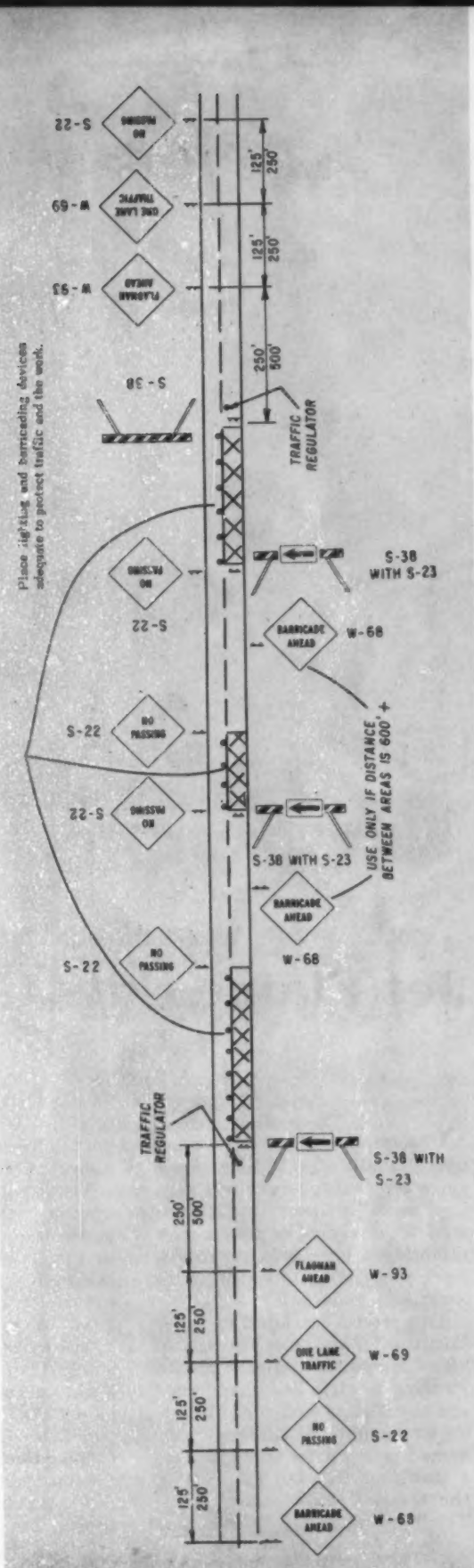
Encouragement to contractors to adopt safety practices, was the purpose of a program launched in recent months by the Michigan state highway department. State highway commissioner John C. Mackie felt that there was much to gain by an accident-prevention program directed by the department and integrated with the department's construction operations.

The program was first presented to supervisory construction personnel of the department at their annual meeting last spring in Lansing, then later it was reviewed with the Michigan Road Builders Association at their 1959 spring meeting. Joint meetings, including contractors' supervisory personnel and state highway district and project engineers, were then held in each of the ten highway districts for detailed discussion of the program. Representatives from the accident prevention committee of the Michigan Road Builders Association and from the contractors' casualty insurance underwriters participated in the district discussions.

To get the program under way, specifications were developed to set forth the general provisions and procedures to govern the operation of the program. Several specific safety requirements have been included. Others will be added as they are developed, and ultimately these will be set up in manual form. These "Supplemental Specifications for Accident and Fire Prevention" have been included in all bid proposals for highway construction since September, 1959.

The pre-construction conference or meeting between the contractor and engineer is an important

Standard plan details (Sheet 3) showing location of traffic control devices for situation where traffic is maintained during construction or patching of a 2-lane roadway, with one lane at a time occupied by the work force. Applicable for series of operations 200 to 1,500 ft. apart. Reference numbers refer to a table (not shown) on this plan sheet, giving sign size and legend for each number.



part of the procedure, since it provides an excellent opportunity to develop the safety pattern for the project under contract. The contractors' "Construction Safety Program" provides the basis for discussion. The program, as finally approved at the meeting, then becomes a part of the contract.

Discussion is not limited to the items enumerated in the Supplemental Specifications but may include any phase of safety or accident prevention covered by the general specifications, particularly traffic control and responsibility to the public.

Our general specifications on Maintaining Traffic are currently being revised; however, in general, where traffic is carried over or along a project, the department provides and erects the necessary signs and traffic control devices. The contractor provides the necessary lights and traffic regulators (flagmen). If an item of Maintaining Traffic is contained in the contract, this is a lump sum pay item. If no such item is included, then these operations are considered incidental to the construction of the project.

Where through traffic is detoured around a project, the contractor is not responsible for the maintenance or markings of such a temporary route. Our Traffic Division has recently developed standards for signing construction and other operations along trunkline routes.

Construction operations are now beginning to be covered by the new safety program specifications. As the 1960 season opens up, many of the new ideas and requirements will be observable projects over the state.

Operator is burning off a one-foot-deep section of granite. (Right): Oxygen for the Queensborough Bridge job was supplied from this 10-cylinder Oxweld manifold which was easily moved from one pier to another.

Jet Flame Cuts Granite Piers

New York City's double-deck Queensborough Bridge is getting a face-lifting with the help of a new process known as Stone-Shaping. Small jet flames were recently used to cut sections of granite from the bridge's four main supporting piers, preliminary to widening the lower deck roadway.

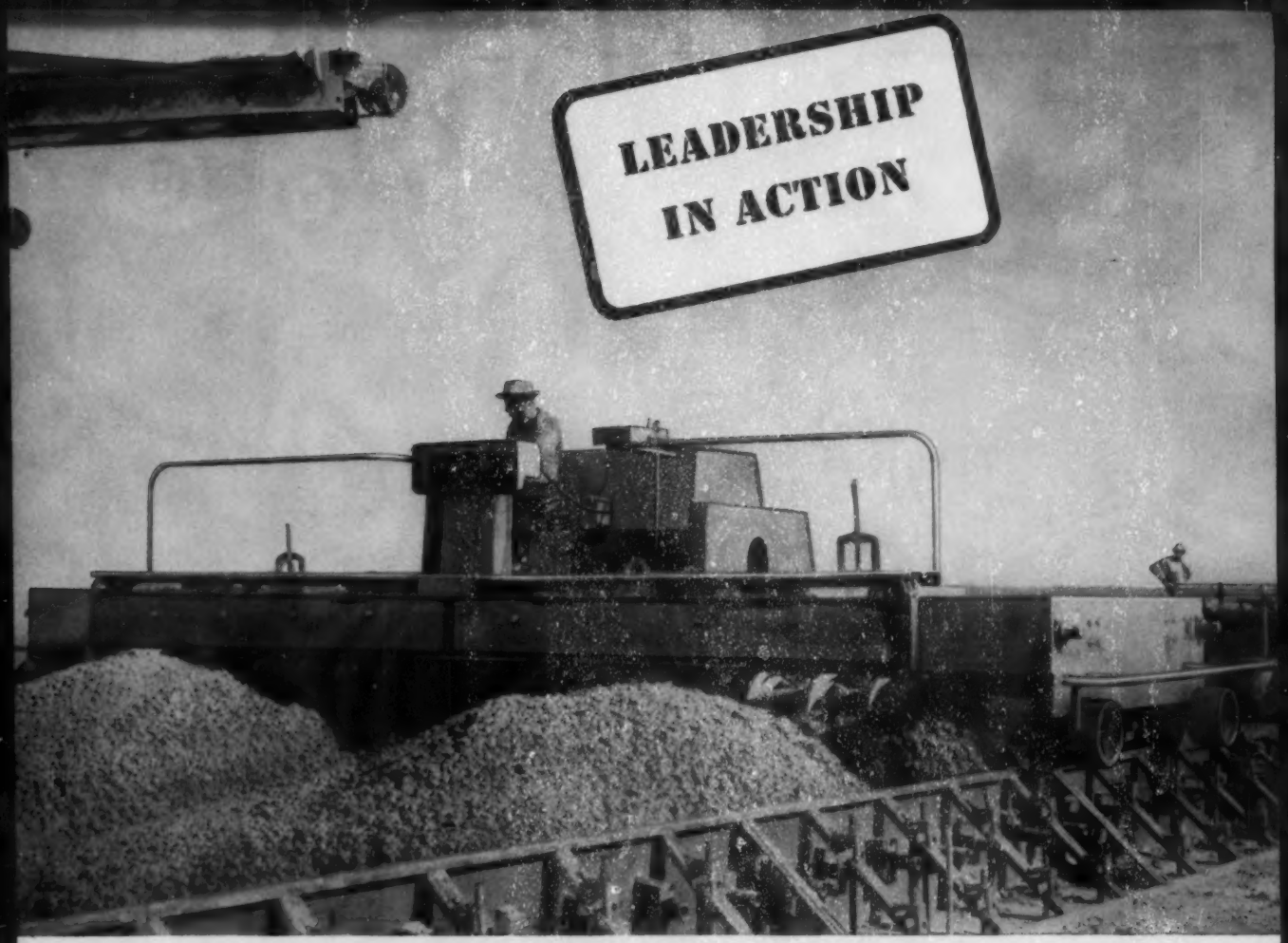
This process developed by Linde Company, Division of Union Carbide Corporation utilizes a rocket-jet torch to carve and shape stone at a new high rate of speed. Reaching temperatures of 5500 deg. F, the Stone-Shaping flame spits out from a small manual torch known as the Oxweld FSJ-6 Stone-Shaping Torch. Oxygen and kerosene are combined to produce the intensely hot flame in an internal water-cooled rocket chamber.

The resulting flame is emitted from a convergent-divergent type nozzle at a velocity of 7,000 ft. per sec. This combination of intense heat and high velocity causes stone to spall. The flame is controlled by a fuel valve.

Joe DeAngelo of J. DeAngelo Stone Masons Inc., Bethpage, New York, the contractors handling the job on the Queensborough Bridge, said that "Using Linde's Stone-Shaping torch on one pier, one man did the job of removing granite that would have required a crew of at least five men with mechanical tools and would have taken at least twice as long to complete." A one-foot-deep section of granite 15 ft. high had to be removed from each of the 25 ft. wide granite piers.

Utah Adopts Dollar-Stretching Policy

A "dollar-stretching" policy has been announced by the Utah State Road Commission, whereby roads will be built to basic standards initially, then through stage construction completed to standards required by the Bureau of Public Roads.



IMPROVED REX SPREADER

Outpaces 3 Pavers on 27″ Slab Job!

Talk about concrete spreading capabilities—and speed! At this big Air Force base a new Rex Spreader in a *single pass* handled low-slump concrete for 27″ slab 24′ wide!

It did this massive spreading job (actually working with heaped mix 36″ deep) at such a rapid rate that it easily maintained the pace of *three* 34E dual-drum pavers!

On this job the Rex Spreader speeds up the entire paving operation. Because of its ability to handle the heaviest, driest mixes in deep-dumped batches, it is not necessary to spend time ribboning the concrete. Fast, concentrated bucket discharges result in fastest-possible production.

Big, efficient power plus more effective screw action gives Rex this time- and money-saving speed. Twin screws spread concrete evenly and thoroughly—firm it up solidly against the forms. Voids, pockets and poorly distributed mix are problems of the past.

Note the modern functional design. All shafts and working parts are below deck, protected. The roomy operator's station gives him sitting-down efficiency. He can see ahead, underneath (through steel grate) and behind for best work results. All functions are hydraulic except transmission speed changes. Quick and infinite frame adjustments are easily made.

- Two models: 10′-15′, 20′-25′.
- Large, 16″ screws with replaceable blade liners.
- Strike-off sets for 7″ above and 7″ below forms.
- Telescopic design.
- Four speeds forward to 52.8 f.p.m., reverse to 105.6 f.p.m.
- Four-wheel drive, positive hydraulic steering.

New literature is available from your Rex Distributor. Or write CHAIN Belt Company, 4652 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto, Ontario.

REX®

CONSTRUCTION MACHINERY

. . . for more details circle 352 on enclosed return postal card

NEW ROCK LOADING TEAM

Hauler: 13-ton Michigan Tractor Wagon
Loader: 2¾ yd Michigan Tractor Shovel
Output: 2,400 tons daily on 2-mile cycle

Four years ago, the Fort Scott Hydraulic Cement Company, Fort Scott, Kansas began a program to replace their four crawler-loaders and two 10-ton tandem-axle dump trucks with the most modern equipment available.

The program was completed when a 13-ton rear-dump Michigan Tractor Wagon went on the job a year ago. Its addition gave Fort Scott, one of the nation's three major natural cement producers, an all Michigan fleet. The Wagon teams with a 2¾ yd Model 175A Michigan Tractor Shovel in the rock pit. Three other 2¾ yd Michigan Tractor Shovels handle the crushed rock, coal, and clinkers in this 4,500 barrel-a-day natural cement plant.

Tractor Wagon hauls 120 tons per hour

It's the heavy rock loading and hauling operation that Mr. Pat Thomas, president of the 92-year-old firm, points to as being the best example of how the Michigan machines have improved job efficiency.

Shot Florentine limestone is currently being loaded out of the far end of a pit 90 feet wide and 5,000 to 6,000 feet long. This makes the average haul cycle, between pit and crusher, about two miles.

The 162 hp Tractor Wagon's stability and speed of up to 31 mph is a prime production factor in the mile long *uphill* run from pit to crusher. With torque converter and full power shift, power and speed are instantly adjusted to match the load demand.

On two 10-hour shifts, the Tractor Wagon, sideboarded to meet rated ca-

Michigan 162 hp Tractor Wagon, with torque converter and power shift providing top speed, barrels uphill to plant.

With hydraulic rear dump, Michigan unloads fast. Quick-interchange feature, Wagon for 10½ yd Scraper, provides added versatility.

In spare time, 13 ton Tractor Wagon takes crushed stone from hopper to stockpile.

BOOSTS PRODUCTION 25%

pacity, and the highly-maneuverable 2¼ yd Tractor Shovel will load out an average 2,400 tons of rock . . . rock which weighs, when loose, approximately 2,500 lbs per cu yd.

2 Michigans outwork 3 units formerly used

Production in the rock pit has risen 25% since the Tractor Shovel replaced a crawler rig with similar bucket capacity, and the Tractor Wagon took over the job formerly handled by two 10-ton dump trucks.

When maximum production from the crusher is not a factor, the Tractor Wagon is taken off the shot rock haul and used by itself to build up the crushed rock stockpile, an operation previously handled by two to four random-sized dump trucks.

Compaction has reduced haul road maintenance

An added advantage, according to Mr. Thomas, is the Michigans' compacting action on the haul roads. The 31,500 lb (plus load) Model 110 Tractor Wagon and the 29,000 lb Tractor Shovels have reduced maintenance and actually improved haul road conditions as they travel between pit and plant.

Upkeep "phenomenally small," says president

"With all five of the Michigans working constantly with heavy loads and over sharp rock and abrasive cinders, *we have spent less than $2100 on overhauls, parts, tires and labor during the past three years*," says Mr. Thomas. "I think this figure is extremely low considering what a machine goes through in a cement plant operation of this type. We have had virtually no downtime."

If you're hauling bulky materials off the highway, perhaps a Michigan Tractor Wagon could increase your production, too. When you pair it with one of the eight Michigan Tractor Shovel models (up to 6 cu yds), you've got a team that can't be beat. Let us demonmonstrate. Just call. There's no obligation, of course.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

CLARK EQUIPMENT

2479 Pipestone Road
Benton Harbor 13, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

. . . for more details circle 288 on enclosed return postal card

600 hp Michigan replaces tandem-pushers on Hugh Steele Inc. highway job

Earns $126 extra

"Earning their keep!?! Why, in a year, I could run them into the middle of the Chattahoochee River, and still walk away with a profit!"

Hugh Steele is talking about three rubber-tired Michigan Dozers that are making their mark in big, bold dollar signs all around his 18.1 mile highway contract near Ashburn, Georgia.

Biggest profit producer is in the cut. It's a *600 hp* Michigan Model 480! This big rig started out in demonstration against two 190-hp crawlers push-loading in tandem. The results were so one-sided Mr. Steele wouldn't let Atlanta distributor Stith Equipment Co. take the Michigan off his job.

Scales, stop watch tell the story: 14 more loads per hour

With scales and stop watches, this production story was recorded:

Material	Model 480 Sandy clay (3000 lbs/yd)	Tandem Crawlers Sandy clay (3000 lbs/yd)
Scraper capacity (each of 12 machines)	25 yds heaped	25 yds heaped
Average load time	30 seconds	44 seconds
Pusher cycle time	60 seconds	84 seconds
Average payload, scale weighed	60,000 lbs	48,600 lbs
Average pay yds	20.0	16.2
Scraper loads per 50-min hr.	50.0	35.7
Scraper output per 50-min hr.	1,000.0 yds	578.3 yds

In terms of cold cash, these figures mean simply that the Michigan *earns more dollars per hour* A lot more! In 30c dirt, its *extra earnings* average *$126 per hour* over tandem pushers, according to Mr Steele.

Faster pushing nets bigger pay loads

Watch a few push-loading cycles and you'll see why. The Model 480 has half again as much power as the two crawler-pushers *combined*. It backs up faster than crawlers, and being one machine instead of two, naturally positions faster (24 seconds faster, on the

Biggest Michigan of all, this 600 hp Model 480, does more work than two big crawlers combined.

Steele's two 262 hp Model 280 Michigans spread and compact 20,000 yds of fill a day. In "spare" time, units also handle such scattered odd jobs as dressing stockpiles (below), towing disabled vehicles, backfilling around culverts.

per hour

average, on this job). It pushes faster (at speeds up to 5 mph), which both reduces load time and keeps the dirt more "alive." Result: higher, tighter, bigger loads—and more of them.

Other Michigans save time on fill-compaction assignment

Just as the big Model 480 is producing profits in the cut, so too are two other Michigan Dozers saving money for Owner Steele on the fill. These units are both 262 hp Model 280's. They are spreading fill and compacting . . . achieving specified 95% Proctor in two to three high-speed (7½ mph) passes.

Speed scattered odd jobs

And that's not all. Go-anywhere 28 mph mobility allows the Michigans to sneak away from main assignments to tackle emergency jobs. Towing disabled vehicles, for example. Back-filling around culverts. Building up low spots in haul roads.

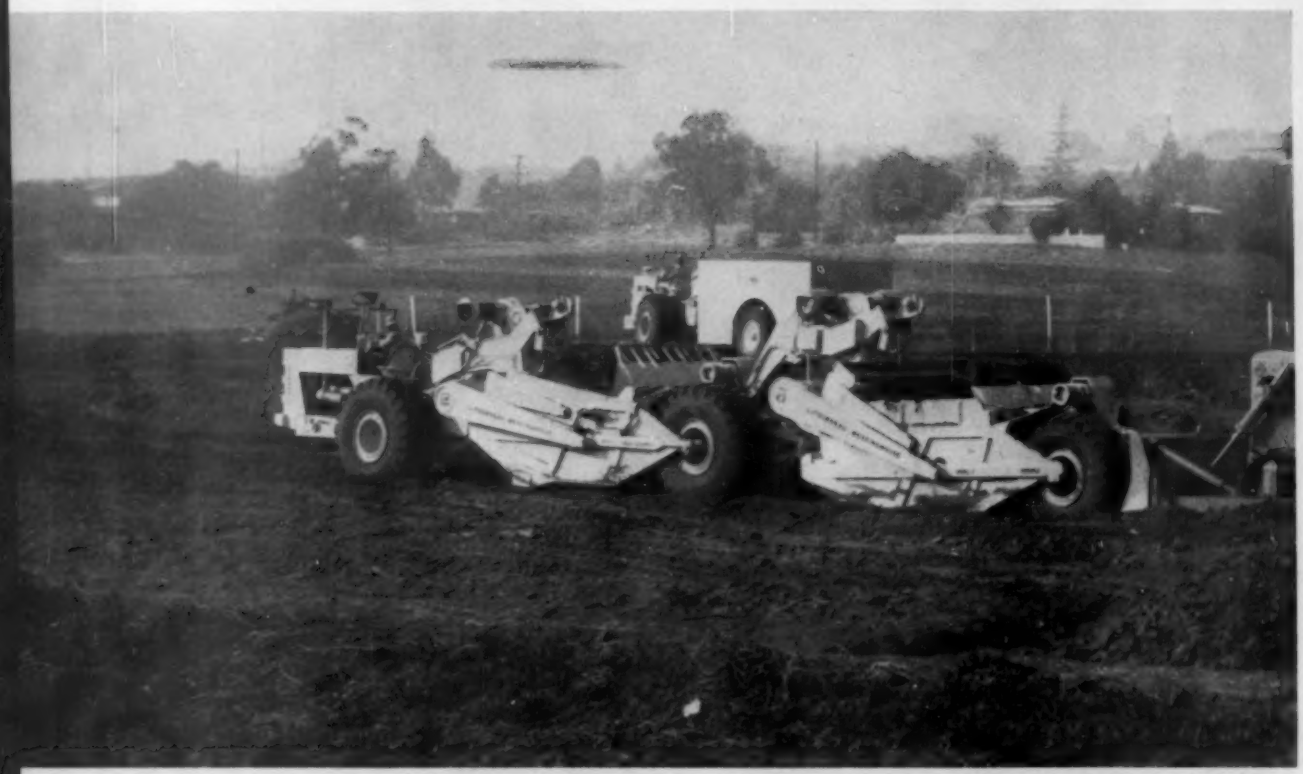
These are just a few of the odd jobs. *But the real advantage of Michigan Dozers,* Mr. Steele says, *is their ability to outperform crawlers on many production jobs too.* And do it day after day, with dependability equal to that of Michigan Tractor Shovels. There are four size Dozers to choose from: 162, 262, 375, and 600 hp. Your Michigan Distributor will be glad to show you one in action so you can judge its advantages for yourself.

Michigan is the registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

2497 Pipestone Road
Benton Harbor 16, Michigan
In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

. . . for more details circle 287 on enclosed return postal card



Tandem "C" scrapers with V-Power "C" Tournapulls and pusher—Boeck Paving Com-

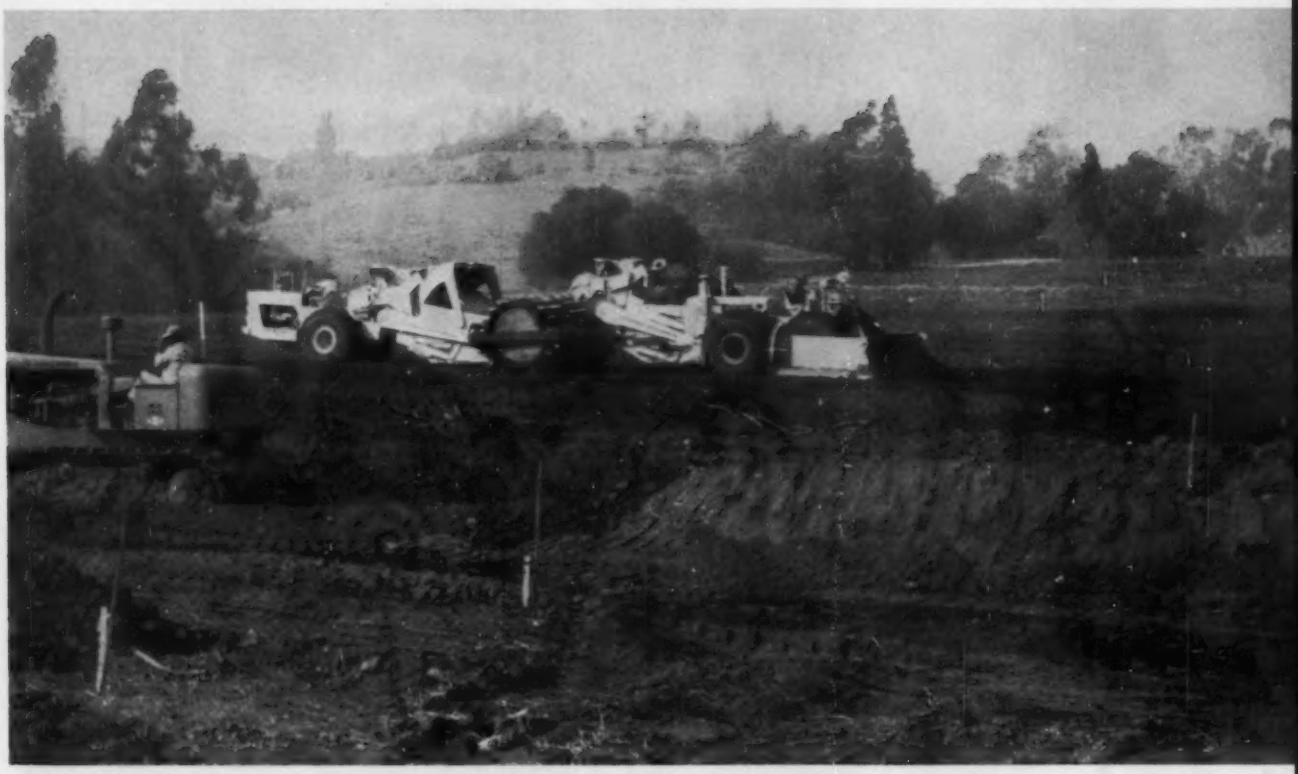
Tandem Scrapers: New-Old Competitive Tool

Scraper owners will be hearing much about the possibilities of tandem pan operation in 1960. Le-Tourneau-Westinghouse Company has adapted its line to this idea, which company spokesmen say will open up new vistas of grading efficiency and profit.

Marketing vice president L. A. DePolis states that tandems are now available behind all three sizes of the company's 2-wheel Tournapull prime movers, as well as with the recently introduced 4-wheel Speedpull. This gives a choice of 17 total capacities with singles or tandems, ranging from 9 cu. yd. in the D size to 56 cu. yd. in the Model B.

The result is that the equipment owner can double or halve his equipment capacity at will, tailoring his machines for different types of jobs or for changing conditions on the same project.

Tandemizing does not call for a bigger more powerful pusher, it is explained. Because the scrapers are



pany's equipment on a grading project at Fullerton, California.

loaded one at a time, loading resistance is about the same as for one scraper behind the prime mover.

The idea of doubling-up scrapers in tandem for greater capacity is not new. However, D. K. Heiple, sales development manager for L-W, explains how the L-W approach makes the idea practical. Principal problems with tandem in the past were awkwardness and lack of maneuverability due to extreme length, plus the complication of running long reeves of cable from the rear scraper to a power control unit on the prime mover. The L-W system, he claims, eliminates both drawbacks.

Controls for the rear scraper as for the front, transmit power for tailgate, apron and bowl lift through electric cable, eliminating the long rope runs. The maneuverability problem was solved by dispensing with the rear scraper's front axle and wheels and letting it ride "piggyback." This shortens the overall length and permits the second scraper to turn a full 90-degrees from the front scraper.

Almost all such electric control rigs built since 1947 are easily tandemized in the field at modest cost.

Tandem Economics Analyzed

The best balance of the scrapers' capacity to tractor horsepower for lowest net cost per yard is a changing thing, notes the LeTourneau-Westinghouse engineers in discussing its tandem idea. Heavier-than-normal materials or adverse grades may encourage a contractor to add horsepower to his fleet. Conversely, easy loading materials and low rolling resistances quite often result in the addition of sideboards.

Comparing to any size scraper as a single tool, the factors that make lower cost dirt possible with tandem scrapers are:

1. Capacity doubles with a second scraper of same size, without same effect on other factors affecting the unit cost.

2. Width and height are unchanged; do not affect traffic on the haul road, or between-job moves.

3. Length is substantially greater, but not twice the original unit; and with a semi-trailed rather than full-trailed second scraper, the turning area needed increases only 20-25%.

4. Axle loads do not increase proportionally. Yard for yard, tandems area easier on haul road maintenance than singles of equivalent capacity.

5. Pusher power is unchanged, over a single unit. Tandem scrapers are loaded individually, save pusher shuttle time, utilize the same push tractor.

6. Gross weight for the available power to handle increases substantially, but does not double. Properly applied, a given tractor with two scrapers will haul substantially more than half as many loads as a single in a given period. Total production increases.

Seen on 300,000 cu. yd. grading job of Martin Brothers for a housing and street development near Richmond, California. Push-loading the clayey soil, which often required ripping, was done with a single pusher, loading one bowl then the other.

7. Costs of owning and operating obviously increase; but, again, not in proportion to the increased capacity and productivity.

8. Adaptability is inherent. Capacity is halved or doubled by unhitching or re-attaching the second scraper to meet changing job requirements.

The following table illustrates how the various factors affect final production and costs. As a base, a wheel tractor and scraper of 14 cu. yd. struck capacity (270 hp), selling for about $43,000, is used, to which is added as a semi-trailer a second scraper of the same size.

	Single Scraper	Tandem Scraper
Horsepower	270 hp	270 hp
Empty Wt.	44,000 lb.	77,000 lb.
Capacity Struck C.Y.	14 c.y.	28 c.y.
Heaped C.Y.	20 c.y.	40 c.y.
Tons	22 c.y.	44 c.y.
Gross Load	88,000 lb.	165,000 lb.
Wt. to Power Ratio	6.14 hp/ton	3.27 hp/ton

The gross weight is not doubled, though the net load has; the single unit has 1.87 the power to weight of the tandem, not twice.

	Single	Tandem
Price	$43,000	$60,000

The price differential includes the second scraper, higher-ply tires for the center axle carrying the hitch load of the second scraper, plus estimated controls for the second unit.

	Single	Tandem
Estimating hourly owning and operating cost	$16.65	$21.75

(For this comparison costs were calculated at .0003 times list price, plus operator at $3.75.)

At $21.75 per hour, the tandem costs about 1.31 times as much to run as the single scraper. And in cubic yards struck, heaped, or in tons, it has two times the capacity.

If the costs were doubled along with the capacity, the two units would obviously have to make equal cycles to produce equal costs. However, the hourly cost of the tandem is far from double and considerably less cycles will produce equal dirt costs. For example, if the tandem makes 10 trips per hour and hauls 28 pay yards, the dirt cost will be $21.75 (the hourly cost) divided by 10 x 28 = 280 cu. yd. (the production) and is 7.75 cents. At $16.65 per hour and a 7.75 cent dirt cost, the single unit must move 215 cu. yd. per hour (16.65 + .0775).

At half the pay load (14 cu. yd.), 15.3 trips are required to move the 215 cu. yd. total. Or the single scraper unit must make 1.53 trips each time the tandem makes one. (The comparative figures do not include other job costs.)

The question at this point becomes one of performance involving the hp-to-weight ratios of the two machines. Specific road and grade conditions which would be considered on actual job estimating are not needed for a valid general comparison. It is simply assumed that cycle times will bear a direct relationship to the two power to weight ratios modified by the percentage of the time that the extra power of the single unit can be used effectively.

Extreme Conditions Compared

The power of the single unit has already been shown to be 1.87 times that of the tandem, which if usable all the time should produce 1.87 trips for each trip of the tandem. Since it takes only 1.53 trips of the single to equal tandem costs, under 100 percent use of power conditions the single will definitely produce cheaper yardage.

On the other hand, where job conditions would prohibit taking any advantage of the power, equal trips would result, and the tandem produces substantially lower costs.

Continued on page 81

SPECIAL REPORT TO CATERPILLAR OWNERS:

CAT CATERPILLAR

Parts you can trust
...cost less per hour

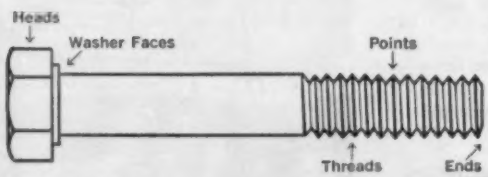
CAT ALL-PURPOSE BOLTS AND NUTS ARE STRONGER... HOLD LONGER...GRIP BETTER

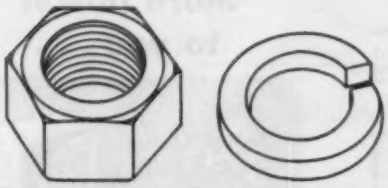
Ever twist a head off a bolt because it wasn't *strong* enough . . . or scrape your knuckle when your wrench "rounded off" the head because it wasn't *hard* enough? It's not likely to happen if you use Cat all-purpose bolts and nuts. They're highest quality in every way. For example, Cat bolts exceed Grade 6 in all requirements as rated by the Society of Automotive Engineers. Grade 5 is the average rating of bolts used in other earthmoving equipment.

WHAT GRADE OF BOLTS DO YOU USE?

Here's what's normally stocked at...	Hardware Stores, Automotive Outlets	Industrial Supply Houses, Other Mfr. Outlets	Special Order Only	Caterpillar Dealers
SAE	Grade 0-3	Grade 5	Grade 6	Exceeds Grade 6
Minimum Tensile Strength (Breaking point)	55,000-110,000 PSI	105,000-120,000 PSI	133,000-140,000 PSI	142,000 PSI
Hardness Rockwell Rating	RC 0-28	RC 19-32	RC 28-36	RC 30-38

If you need tougher, stronger hardware—get Cat all-purpose bolts and nuts. You can count on them to do a better job longer because they're stronger and harder than others.





HERE ARE OTHER CAT BOLT BONUSES YOU GET. *Heads* are higher and full size—easy to get wrenches on. *Flats* are hard and parallel—corners don't round off, are easy to grip. *Threads* are rounded at the roots and free from laps and burrs. *Points* are smooth and uniform. *Ends* are precisely rounded or chamfered—cross-threading doesn't occur. *Washer faces* are flat and have uniform thicknesses. *Heads and threads* are concentric to shaft—heads and nuts fit flush.

NUTS AND LOCK WASHERS are matched to every size bolt to give complete top-quality fasteners, too. Nut threads resist stripping. Corners do not round. Clean, smooth-fitting threads make installation fast and easy. Lock washers have smooth surfaces for maximum wear and strength.

When you need the best bolts and nuts to keep your machinery and other equipment together, see your Caterpillar Dealer. He has a large selection.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

SERVICE TIP: Get your free copy of Caterpillar's bolts and nuts reference booklet at your Caterpillar Dealer today. It has the sizes, threads and part numbers listed for quick, easy ordering. Before buying any hardware, check Cat prices first.

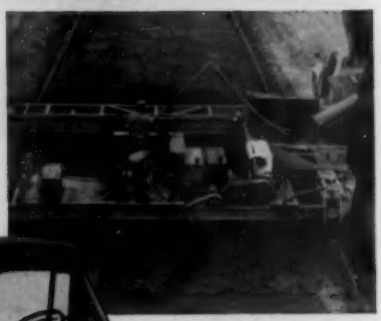
CATERPILLAR

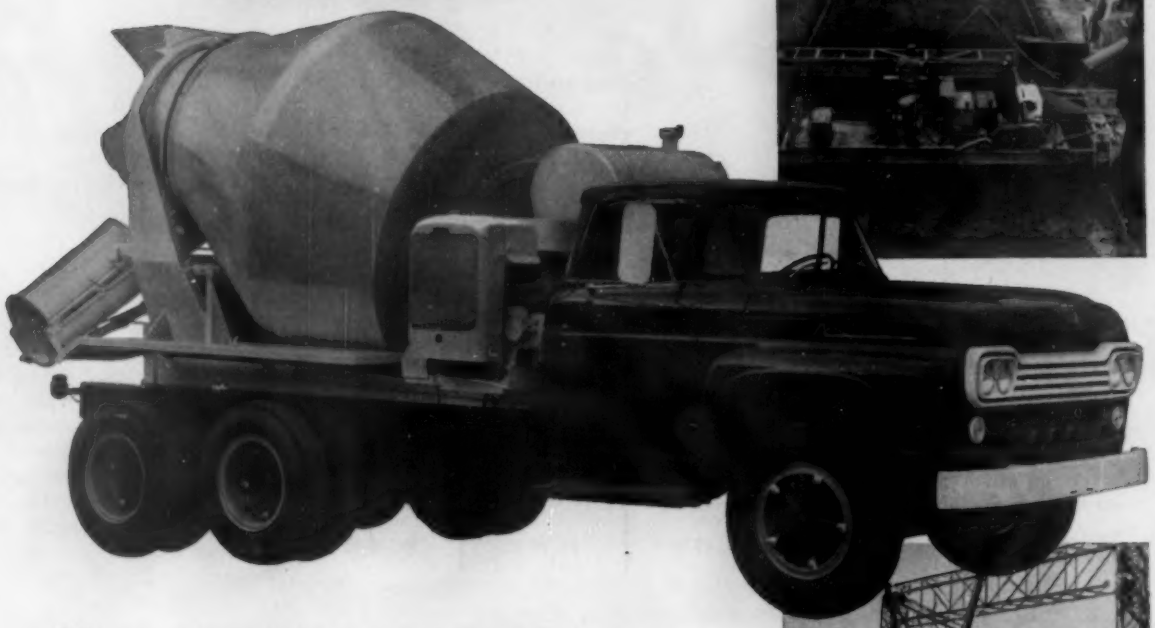
Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

. . . for more details circle 284 on enclosed return postal card

In the ready-mix and construction industries THE SWING IS TO

Ford
INDUSTRIAL ENGINES





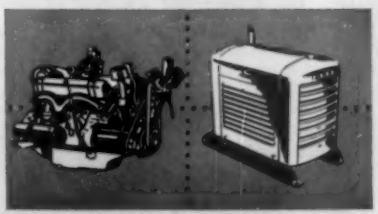
More and more construction projects are being powered with dependable Ford Industrial Engines every day. Here's why:

ADVANCED FEATURES—Ford's Short Stroke design reduces friction and wear. Deep-Block construction provides smooth engine performance. *And all Ford engines offer higher power-to-weight ratios than ever before possible!*

GREATER ECONOMY—Overhead valve construction throughout Ford's entire engine line permits higher engine compression ratios, provides better breathing for greater power output, and makes servicing easier, quicker and less costly.

PARTS AND SERVICE—Ford's world-wide dealer network (over 10,000 Ford Dealerships in the U.S. alone) offers prompt, efficient service *wherever you go.* For these and many other reasons, you'll find that Ford power is *right* for your construction equipment, too!

More power to you . . .



Visit the Ford Motor Company Display at the Sand and Gravel Show . . . Feb. 15 to 18 . . . at the Chicago Coliseum—Booths 16 and 17

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to: → FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

. . . for more details circle 300 on enclosed return postal card

TANDEM SCRAPERS

Continued from page 78

In actual practice neither of these conditions is likely to exist, and the problem is to determine where between them the conditions lie.

Load times do not carry the 1.87 to 1 ratio in spite of loading two scrapers instead of one. The elimination of the pusher exchange time actually puts the load in the tandem scrapers in less total time than it could do so in two single loads. Length of haul, curves, transmission gearing, all combine to make it tougher for the extra horsepower to be brought to bear efficiently. How much less than 100 percent will be determined by the job conditions, and the performance of the two units can be calculated.

A general calculation of the relative abilities between the two limits shown is also possible. For easy understanding assume that the tandem makes 100 loads in a given time. If the power of the single is usable 100 percent of the time, it has been shown that it will make 187 loads in the same period.

Assume next that the power is fully usable 90 percent of the total, and equal in 10 percent. Then while the single makes 10 trips, the tandem makes 10 and while the tandem makes the additional 90 trips, the single makes 1.87 x 90 or 168. The tandem total is still 100, (90 + 10), the single 178 (10 + 168). Applying the same process of a changing percent produces the following chart. The two do not of course run equally for 10 trips and unequally for the remainder, but the result is the same as if they did. The actual situation would be an equal speed for 10 percent of each trip time and different speeds for the remaining portion.

% of Time Extra Power is Usable	Tandem	Single
100%	100	187
90%	100	178
80%	100	169
70%	100	161
60%	100	152

(With 153 trips necessary for equal costs, this is the approximate break-even point.)

50%	100	143
40%	100	135
30%	100	126
20%	100	117
10%	100	109
0%	100	100

This comparison approximates the abilities of the LW V-Power C Tournapull. Other machines would demonstrate the same principle but should be calculated specifically, to determine the area of best cost as single and tandem units.

Some general conclusions can be drawn from inspection of the chart. One is that, for the tandem to be effective, the conditions should be good enough for gearing or distance to limit the top speeds, rather than a power requirement, either loaded, empty or sometimes both. These conditions would approximate loaded hauls with the combination of rolling resistance and grade resistance below 60 lb. per ton, and empty at perhaps 120 lb. per ton or less. Or perhaps as a rule of thumb —that roads and grades should allow both units to travel at about the same speed on either the loaded or empty portion of the haul. For example, see Table A.

Any further increases in grades or rolling resistance in Table A would also favor the single unit.

Exceptions to the rule of thumb in rolling resistance will occur, one of which would be hauls so short that higher travel speeds simply can not be reached.

Assume a level 300-ft. one-way haul, 200 lb ton resistance.

The tandem is limited by its power to a 4 to 5 mph top speed loaded and 8 to 9 mph empty whereas the single unit has the power to almost double these top speeds. But since the length of haul is so short, the distance for accelerating and slowing down would actually limit both units to an average travel speed of about 6 mph. the tandem suffers to a partial degree only on the loaded portion, and production would figure out (on same basis as in Table A) to 8.02 cents per yard for single and 6.8 cents for tandem operation.

If the distance did not interfere with speed, the single actually has the power to produce 250 cu. yd. per hour—costs 6.66 cents per yd.

On many jobs, then, LeTourneau-Westinghouse is betting that a second scraper added in tandem can produce cheaper dirt, and that on most jobs this scheme will result in substantially more yards per hour compared with a single pair.

Table A

Cycle Comparison, Tandem vs Single Scraper

Estimated production and cost based on haul of 3,000 ft. down a 2% grade and return over the same course.

	Single	Tandem	Single	Tandem
	(60 lb. per ton road)		(100 lb. per ton road)	
Load, turns and accelerate, dump	2.25 min.	3.00 min.	2.25 min.	3.00 min.
Haul	1.58	1.58	1.58	2.49
Return	1.58	2.49	2.17	3.78
Total cycle	5.41 min.	7.07 min.	6.00 min.	9.27 min.
Trips per 50-min. hour	9.25	7.07	8.33	5.4
Cubic yards per load	14	28	14	28
Cubic yards per hour	129.5	198	116.5	151.2
Hourly ownership and operating cost	$16.65	$21.75	$16.65	$21.75
Cost per cubic yard	12.85 cents	11 cents	14.3 cents	14.4 cents

Interior of the new laboratory built by Stewart S and and Gravel Company for Missouri highway department inspector's use shows (left) the sink and battery of hot plates for washing and drying aggregate samples.

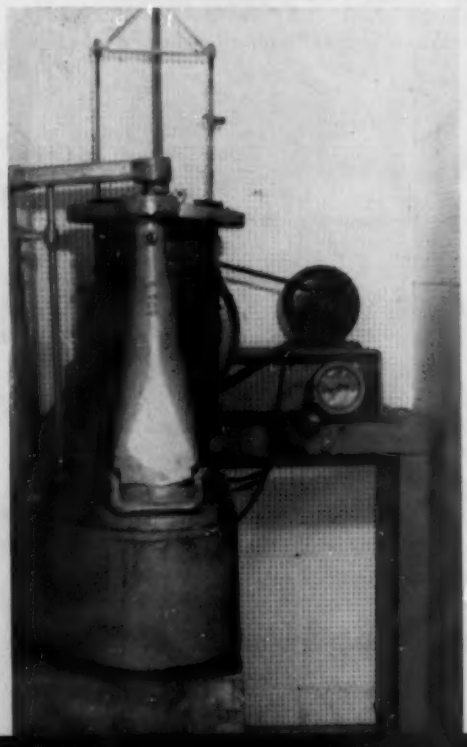
Aggregate Supplier Furnishes Lab Setup

An aggregate supplier serving the Kansas City area has begun providing field laboratory service for customers. This firm, the Stewart Sand and Gravel Company, of Kansas City, Missouri, provided the lab for Neal Trull, engineer-inspector for the Missouri state highway department, at the firm's ready mix plant.

The new facility boasts 200 sq. ft. of floor space with fully-insulated plywood walls, a plasterboard ceiling and air conditioning throughout. Equipment includes washing sink, hot plates for working with aggregate samples, washing and drying equipment.

The lab serves to expedite inspection of concrete for state highway projects in the area.

Mechanical sieve shakers are housed in a sound-proofed closet.



THE JOHN DEERE 840 with HANCOCK SCRAPER

saves time on windrow loading

Loose windrows from fine grading are loaded fast by the Hancock Scraper's slat-type elevator. Paving Contractors, Inc., of Wichita, Kansas, report their unit round-trips every 6 minutes on a .7 mile haul doing work like this.

This tractor and scraper rig handles everything from hard clay to loose sand—and does it economically. The elevator not only speeds loading, but it also breaks up material; this feature insures even, fast spreads. Scraper dumps in seconds by hydraulic ejection.

U-turn requirement of less than 30 feet, permits turns between nearly all standard street curbs. Over-all width is less than 8 feet.

Parts and service available in principal cities. For the name of your John Deere Industrial Dealer, consult your classified telephone directory. For the information you need on this unit or on the John Deere Credit Plan, see your dealer or write today.

John Deere Industrial Division, Dept. 2532, Moline, Illinois

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

. . . for more details circle 295 on enclosed return postal card

Shoulder finisher in action (see also opposite page.) Note how the harrow helped to take a wider swath, and how a roll of material was left by the motor graders to permit tight blading down to contour.

Job Cleanup

Shoulder finisher does fast final shaping for J. C. O'Connor & Sons, Inc.

Cleanup time when final inspection is near can be a money-loser—or it can be done with efficiency and dispatch by using appropriate equipment (good weather helps, too!)

Pictured here is a shoulder dressing operation on US 30 relocation in Indiana. J. C. O'Connor & Sons, Inc., of Fort Wayne, had moved a million yards to build new grade, and paving and shouldering were largely done for a new dual highway.

Again working from pavement, embankments were shaped ready for topsoiling using the O'Connor firm's Lorain motor crane. Excess material truck-hauled for re-use elsewhere in the cleanup.

Two gradermen are leaving the median to final contour, in as far as possibly until the shoulder base material is place, after which they will lay material on up.

J. C. O'Connor's Northwest ¾-yd. dragline on mats, bailing rich topsoil out of a swamp spot for berm and median dressing.

While draglines were shaping the deeper embankment slopes, dozers worked the back slopes, and another dragline on mats loaded topsoil. The assembly here pictured also went into play. It consists of an Insley shoulder finishing machine mounted behind a Cat 12 motor grader. This unit which has the advantage of the grader staying on the pavement, has a main blade which extends out over the first 10 ft. of shoulder width and is adjustable for transverse slope and back or forward angle needed for best skimming. A blade extension, also hydraulically adjustable, extends over the rounded edge of the fill.

"So far, so good," thought the foreman, when this unit was being geared for action. "Why not kill another bird with the same stone, and dress most of the way down the shallower fill slopes, all in one pass —or all in two, if we must make a second pass."

The upshot was to hitch a farm harrow onto the outer corner of the blade extension, as pictured, and give a worker a free ride to weight the harrow down.

The rest of the cleanup was fairly routine, and it followed close behind delivery and placement of granular shoulder material, done with a Blaw-Knox widener in conjunction with skillful motor grader work in the median. The seed-mulch sub-contractor followed on the heels of the top soiling and soon the job was done.

How to iron out a shoulder and slope, all in one pass. The unit is an Insley shoulder finisher.

Here's another reason why Ford Trucks are your best buy!

"OF ALL THE MAKES WE'VE TRIED FORD TRUCKS GIVE US THE LOWEST MAINTENANCE COST!"

ANOTHER REPEAT BUYER OF FORD TRUCKS

Virgil E. Cook, owner of Cook Block and Brick Co., is convincing proof that there is still plenty of opportunity in American business for those sound planning, hard working individuals who want to own their own business. Starting from scratch just 13 years ago, he now owns and operates one of the largest concrete products plants in Eastern Indiana. The workhorses in his fleet of 16 trucks are three Ford Tilt Cab Tandems that are used to haul sand and gravel to the plant and make deliveries in and around Anderson.

Hard-working Ford CT-950 tractor leaves Cook gravel pit with 18 yards of aggregate. Aluminum walking beam and rubber suspension system of tandem axle assembly reduce chassis weight, permit higher legal payloads.

Cook's CT-850 with special flat-bed body and Side-O-Matic unloader delivers blocks right to the job site. Unit carries 600 concrete blocks and spots them where needed.

Be sure to visit

The FORD TRUCK DISPLAY

National Ready Mix Concrete Assoc.
Chicago Coliseum, Booths 16-17

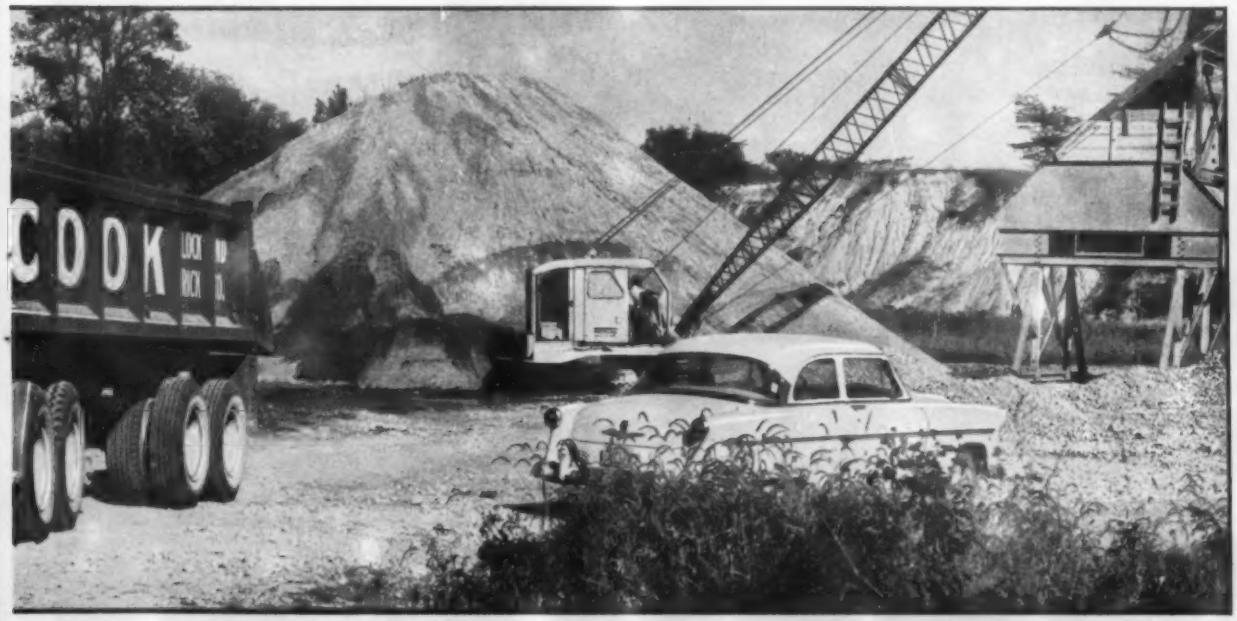
FEBRUARY 15-18

"Our experience has proved that Ford Trucks can be operated at substantially lower maintenance costs than any other make we've tried. And, equally important in a fleet like ours, we find that our Fords spend much less time in the shop. None of the Ford units purchased since 1958 have been in for major repairs and I am still amazed at the way the older ones keep going.

"The best truck we've ever owned is a 1954 Ford C-700 that consistently carries a load of 350 to 400 blocks over all types of terrain. In spite of this severe work it ran 125,000 miles before we replaced the engine. This unit now has over 140,000 miles on the original ring gear and pinion and it went 60,000 miles before we relined the brakes and put in a new clutch. This is outstanding mileage when you consider that we've realized as little as 12,000 miles from competitive ring gear and pinion sets. Clutch and brake life obtained with other makes in identical service was only 20,000 miles. It's results like this that keep our costs low and convinced us that we should stay with Fords when we bought our bigger trucks in '58.

"Our 1958 and 1959 Ford Tilt Cab Tandems give every indication of equalling or surpassing the fine records set by the C-700. The two CT-950 tractors hauling sand and aggregates to our processing plant breeze through traffic and take the hills like they weren't there at all. Our CT-850 equipped with a flat-bed body has the power and traction to deliver finished products anywhere. With Ford's tilt-cab design we get a real plus as far as payload is concerned because we can carry at least 2,000 pounds more weight on the front axle.

"We buy Ford Tilt Cab Trucks because we think they're the best engineered and most modern gasoline trucks in the heavy-duty field. Here at last is a truck built to permit big legal payloads with enough power to move these loads at economical speeds. We pride ourselves on our modern and efficient equipment and consider our Fords one of the most valuable assets of our business."



'60 Fords are built for longer life . . . with Certified Durability!

Whatever your job . . . wherever you do it . . . you'll discover just as Mr. Cook did, that Ford Trucks are the best investment for your transportation dollar.

Certified results of tests conducted by America's leading independent research organization (name available on request) confirm the fact that Ford Super Duties have been refined for still more durability! Automatic radiator shutters, improved electric fuel pumps and redesigned wiring harnesses are typical of the advancements to be found in these units.

Automatic radiator shutters reduced the coolant temperature variation recorded in severe mountain road tests from a 79° range to a 20° range. Engine operation with coolant temperatures in the 167° to 187° range means less expansion and contraction, more efficient combustion and better lubrication . . . all of which contribute to longer engine life.

Dynamometer tests showed *no vapor lock* with Ford's submerged-type electric fuel pump at temperatures up to 200°. Incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under the same conditions. Shaker table tests plus constant exposure to oil, water and heat proved 1960 wiring harness to be *three times longer lived.*

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

. . . for more details circle 301 on enclosed return postal card

Checking tension is an important part of successful high-strength bolting. Here a torque wrench is being applied to a nut.

High-Strength Bolting

What the contractor's personnel and engineer's supervisory staff need to know about this important development.

The assembly of structural joints using high-strength (A-325) steel bolts has made rapid progress since first proposed to the engineering profession. Used in place of field riveting, high-strength bolting has been widely praised as a practical and effective means of joining structural bridge and building elements.

Previous practice had been to use pins to fair-up holes to joints for attaining dimensions and plumbness of structures. Next, temporary fit-up bolts were installed where necessary prior to riveting. These fit-up bolts drew the members together. The final step was the replacing of the bolts, one by one, with rivets, a duplicate operation.

Using pins as before to align holes of joints to attain dimensions and plumbness of structures, the new procedure is to use high-strength bolts for fitting up. These bolts remain permanently in place, instead of being removed as for riveting. These bolts are made of high-strength steel, which permits them to be placed under high tension, introducing high clamping forces in the bolts and high friction between the connected parts.

Thus, connected joints will not slip until their loads are well beyond their working loads. Of great importance is the fact that the shear and tension capacities of the bolts are greater than those of rivets, the bolts being made of carbon steel heat-treated for strength.

Hardened washers are placed under both head and nut, to permit the torquing of the bolts to high tensions without scoring the connected materials. The hole sizes for bolts are the same as those for rivets of the same nominal diameters.

Important Advantages: The use of high-strength bolts offers several important advantages. In general, fewer crews are required than for riveting, yet the steelwork goes up fast and at relatively low cost. New men can be trained quickly to handle impact wrenches, a definite time-saving factor in certain areas.

This method of construction is less noisy than riveting, making it desirable for those areas where severe noise is objectionable, as in the vicinity of hospitals, convalescent homes and the like.

High-strength bolts are used cold. No heating equipment is required as with riveting. There is thus no fire or related hazard.

In structures where severe vibration is encountered, such as bridges and ramps or elevated highways, the bolts stay tight indefinitely, reducing maintenance and inspection costs materially.

During the development of high-strength bolting procedure, many methods of assuring the proper

Two men are usually sufficient to handle any bolting-up situation. All that's needed is a holding wrench and an impact wrench.

bolt tension were tried. The most common method was based on an endeavor to correlate the recommended minimum bolt tension with an equivalent torque requirement, as suggested by the Research Council on Riveted and Bolted Structural Joints.

Unfortunately the results obtained by users of identical methods were far from being alike. It was discovered that the indicated torque was not always in direct relationship with the tensile requirements. In some cases, even though torque readings were correct, the bolts were not fully tightened to the minimum tension. In other cases bolts were broken at the proper torque readings, even though the bolt met the minimum tensile requirements.

The introduction of air wrenches, with automatic air cutoff when the proper torque setting was reached, simplified the attainment of the required torque measurement. But it still did not guarantee that the torque obtained was always equal to the expected tension in the bolt.

Wrench operators discovered how to mark the wrench sockets to determine visually the amount of socket rotation. This helped them more than any other factor in determining when to stop torquing. The socket movement, after reaching the point when the wrench started to impact, seemed to have a definite relationship with the reaching of the proper tension.

Turn-of-Nut Method Approved: In 1955, the Research Council approved the use of the "turn-of-nut" method. They suggested "one full turn after proper fitting-up procedure and the seating of the nut in a hand-tight position." Because of the effect of dents and dirt accumulating in threads, experience proved it was difficult to determine the so-called starting (hand-tight) position and indicated the need for establishing a better starting point for final stressing.

It was then determined by exhaustive tests that the nut could be turned up to the point of impact, using the impact wrench, and then given a half turn in the case of normal connections and a three-quarter turn in the case of very long column bolts, etc.

Bethlehem Steel Company manufactures high-strength bolts and uses them in its own erection practice. In addition to the usual necessity for close and effective supervision, Bethlehem from its wide experience suggests that the following requirements should be met for the installation of high-strength bolts in structural connections:

1—Fair-up holes with enough pins to maintain dimensions and plumbness of the structure. Pins are not to be removed until bolts in balance of holes have been tightened.

2—Install bolts in remaining holes.

3—Tighten a pattern of bolts as would be done for riveting, being sure that the connected parts are properly fitted.

4—"Snug-up" balance and tighten each as directed in tightening procedure.

5—Replace pins with bolts and tighten.

6—"Touch-up" fit-up bolts as directed in tightening procedure.

7—Refer unusual tightening conditions to superintendent or field engineer, who will refer the problem to the district office if necessary.

8—The supervisor of the job should spot check the work frequently.

9—To be sure all tightened connections are properly identified, this procedure is recommended—a) assign identifying numbers of letters to tightening gangs; b) each gang must mark its identification symbol in crayon or paintstik on work they have completed (not before completion); and at each point where there may be several connections, such as beams to columns.

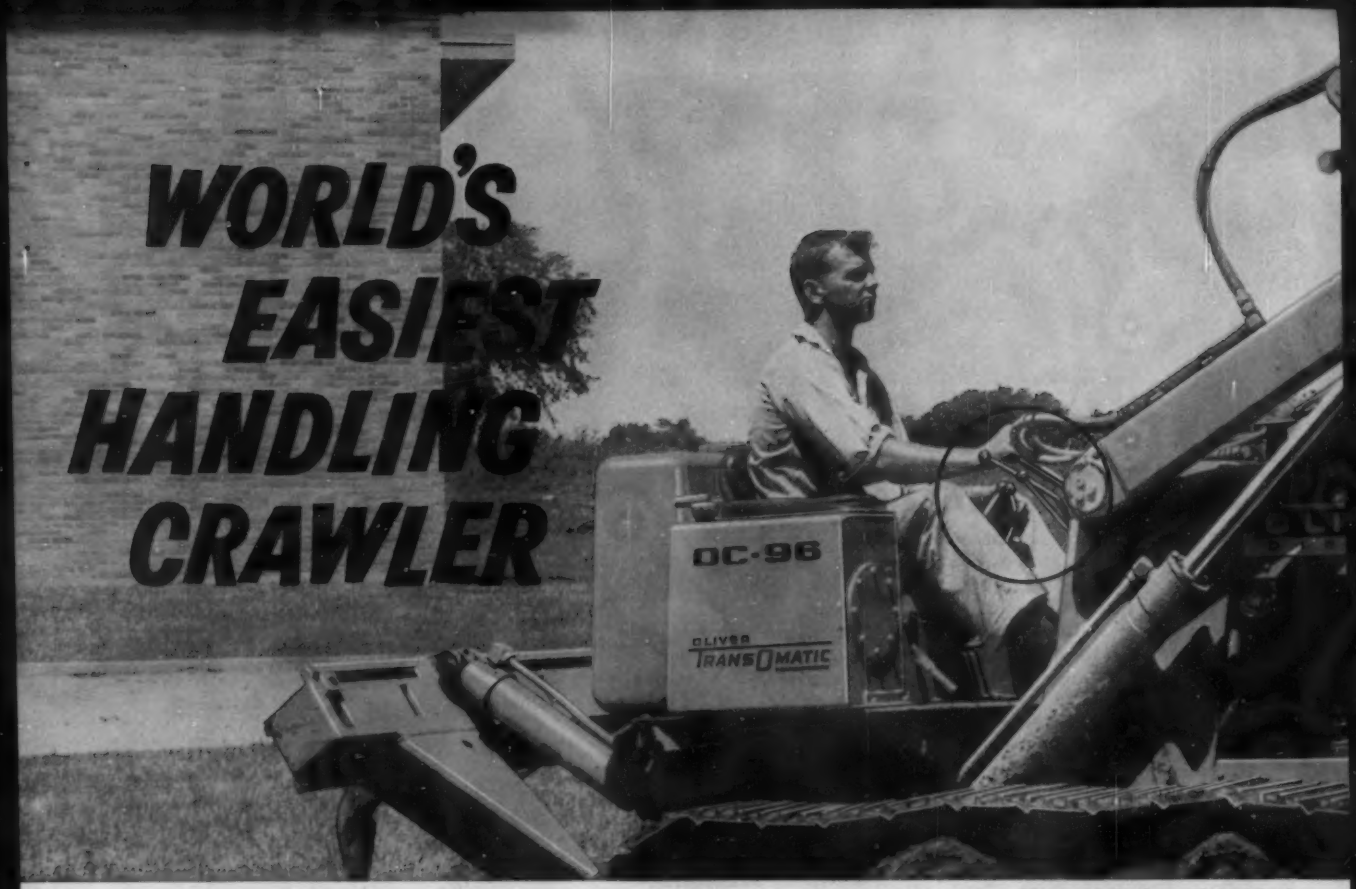
10—Gangs should be organized so that they work on similar connections so far as possible.

11—Supervision, inspecting the completed work, should ascertain:

a. Visually, that all completed

Continued on page 175

WORLD'S EASIEST HANDLING CRAWLER



62 gross engine h.p. with 1-yd. loader

Take the controls of a new Oliver Trans-O-Matic OC-96 Loader —and "let the tractor do the talking!"

Power shifting plus power steering (with three types of turns) makes the startling difference! The OC-96 is *so easy* to operate, it simply cannot be compared with older designs on this count—*or any other!*

You sit in a spacious, foam-rubber seat (offset for ideal visibility)...have full-freedom leg room in the wide, flush-deck compartment.

As for the controls, they're practically "in your lap." Levers for *power* steering, *power* reverse and *power* shift are placed directly ahead of the seat. Your arms are in "resting" position all the time. To brake or foot-steer, pedals do the job just as effortlessly.

Easy operation, indeed! The *easiest* you ever had—plus.

NEW! 3 types of power turns—The only crawler its size giving you counter-rotation turns for about-faces in the tractor's own length—also spot turns and gradual turns.

NEW! Power shifting—Shift from forward to reverse instantly, on the go. No clutching, no gear-clashing with Oliver's all-hydraulic Trans-O-Matic transmission. Four speeds in high or low range—forward to 6.05 m.p.h., backward to 8.07 m.p.h.

NEW! Torque converter—The OC-96 has heaviest-duty torque converter (not automotive kind)—delivering full engine power for digging and crowding in fastest non-stalling operation. Advanced 62 gross h.p. diesel.

NEW 1-yd. loader design—See how the OC-96 is an *integral* tractor-loader minus high, hung-on parts and cross members. Loader side pedestals are actually part of the tractor for low profile, high stability, finest visibility and safety. Fast breakout, greatest dumping reach. No other its size has such rapid work cycle—is so rapid-reversing.

LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

THE OLIVER CORPORATION

Dept. 2232, 400 W. Madison St., Chicago 6, Illinois

"Very fast and maneuverable," says Mr. M. A. Barker, Administrator, Precinct 1, Smith County Road Department, Tyler, Texas. "The OC-96 does as much work as the next largest loader, in addition to being easier to operate, and faster."

In Smith County, the OC-96 is used in the maintenance of roads on such jobs as loading oil mix for surface patchwork, digging ditches, laying culverts and general cleanup. Besides the advantages of operating ease and speed, county officials report that they cut the cost of doing this work to one-half of the former method, which was with rubber-tired loaders!

NEW CATALOG—"must" reading for cost- and comfort-conscious tractor users.

A grader for CONTRACTORS

Competitive bidding factors on modern construction jobs . . . the pressure of work schedules . . . the exacting specifications—all demand much more from a motor grader now than a few years ago. Thus, greatly increased earth-moving ability, stamina, minimum maintenance, and ease of handling are what contractors want in motor graders to meet their needs today and tomorrow.

• Three Galion 160 motor graders on construction of Ohio Highway No. 1 near Conneaut.

Effective Weight and Power

One grader which is meeting all demands with spectacular on-the-job performance is the GALION model 160. Its 30,020 lbs. weight (with scarifier) balanced to the 160 hp direct-starting diesel engine produces tremendous "push power" on the extra-large hydraulic power-shift moldboard.

This efficient pay load combination speeds operations, moves more dirt per pass, reduces the number of passes needed to do the job—gives additional profits or bidding advantage to contractors.

Easy and Safe Control

Any experienced operator who has had the pleasure of putting the GALION 160 through its paces will agree that the 160 is amazingly easy to operate. Features which aid the operator include: combination manual with hydraulic power steering, no "kick back" in the hydraulic control system which is Galion-designed and Galion-built, two-stick shift mechanism for the six-speed constant-mesh transmission, 10 ply 14.00 x 24 tires front and rear, four-wheel hydraulic brakes, complete visibility of blade, and conveniently grouped operating controls.

Simple, Economical Maintenance

The GALION 160 grader is designed for exceptionally long life and for easy servicing. For instance, the positive-acting leaning front wheels have only two grease fittings to service.

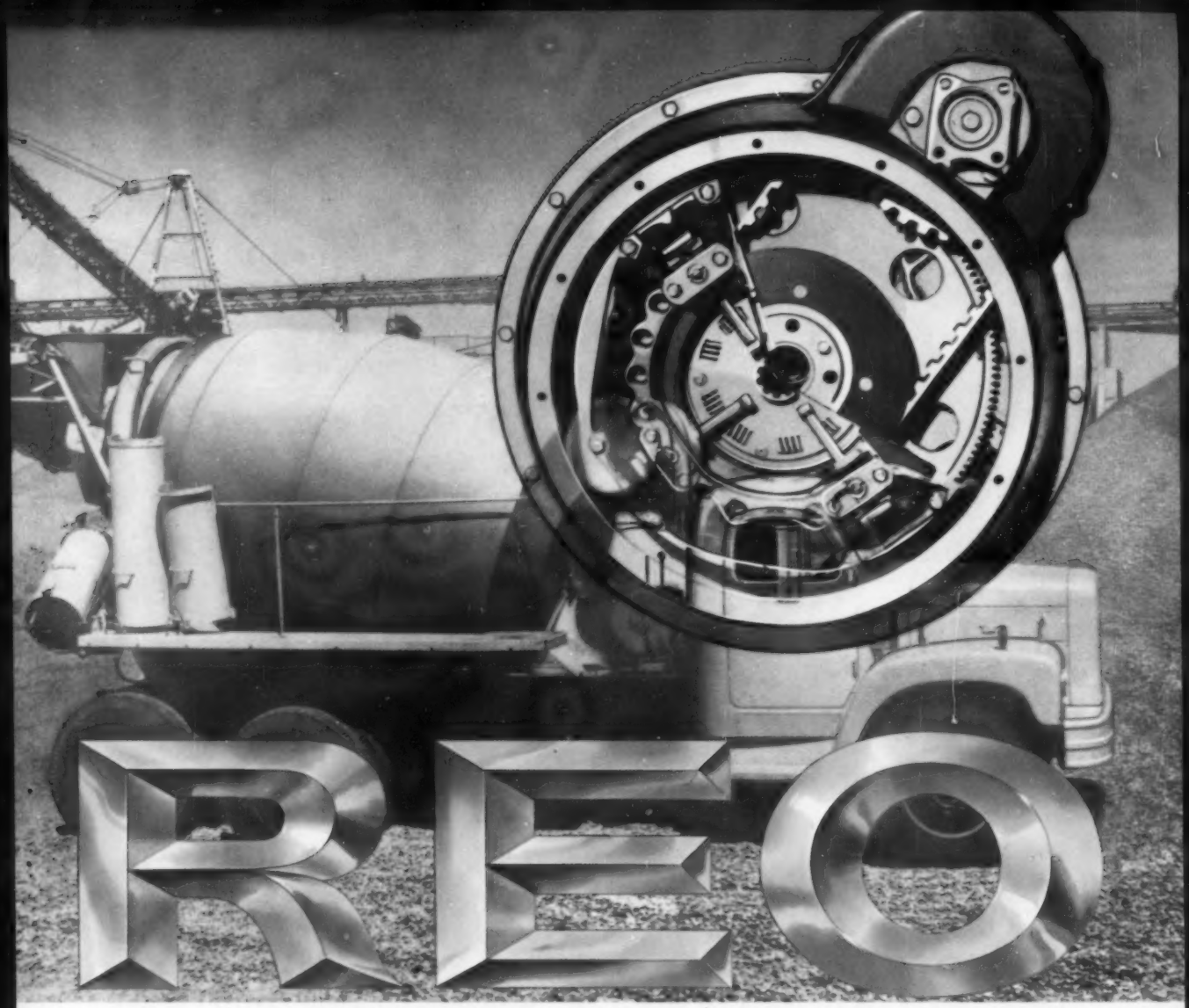
The GALION constant-mesh transmission and final drive are engineered to ratios which reduce stresses and wear to a minimum. It is common for these transmissions to log over 10,000 operating hours without need of overhaul. The powerful Cummins diesel engine is renowned for its economical operation, freedom from trouble, and dependable performance at any temperature or altitude.

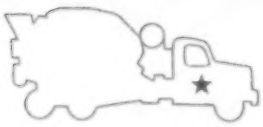
The special feramic-faced, spring-loaded, heavy-duty clutch is not affected by heat or cold. No cooling system is required on this simple, dry-type clutch; consequently frequent servicing is not necessary. Other features of rugged construction that value-conscious contractors appreciate in the GALION 160 are the heavy front axle assembly, extra large (3⅛" x 2") front wheel spindles, full-floating two-piece drive axles which carry no weight, and the extra strong single member box-type frame.

When the going is rough and tough, you will be glad you have GALION 160 Motor Graders on the job. Write for Bulletin No. 421. The Galion Iron Works & Mfg. Co., Galion, Ohio, U.S.A.

• Whether doing precise finish grading, carving out a haul road over virgin ground, or slicing down a steep bank, the GALION 160 has the speed, power, guts and precision control to meet every demand.

. . . for more details circle 306 on enclosed return postal card





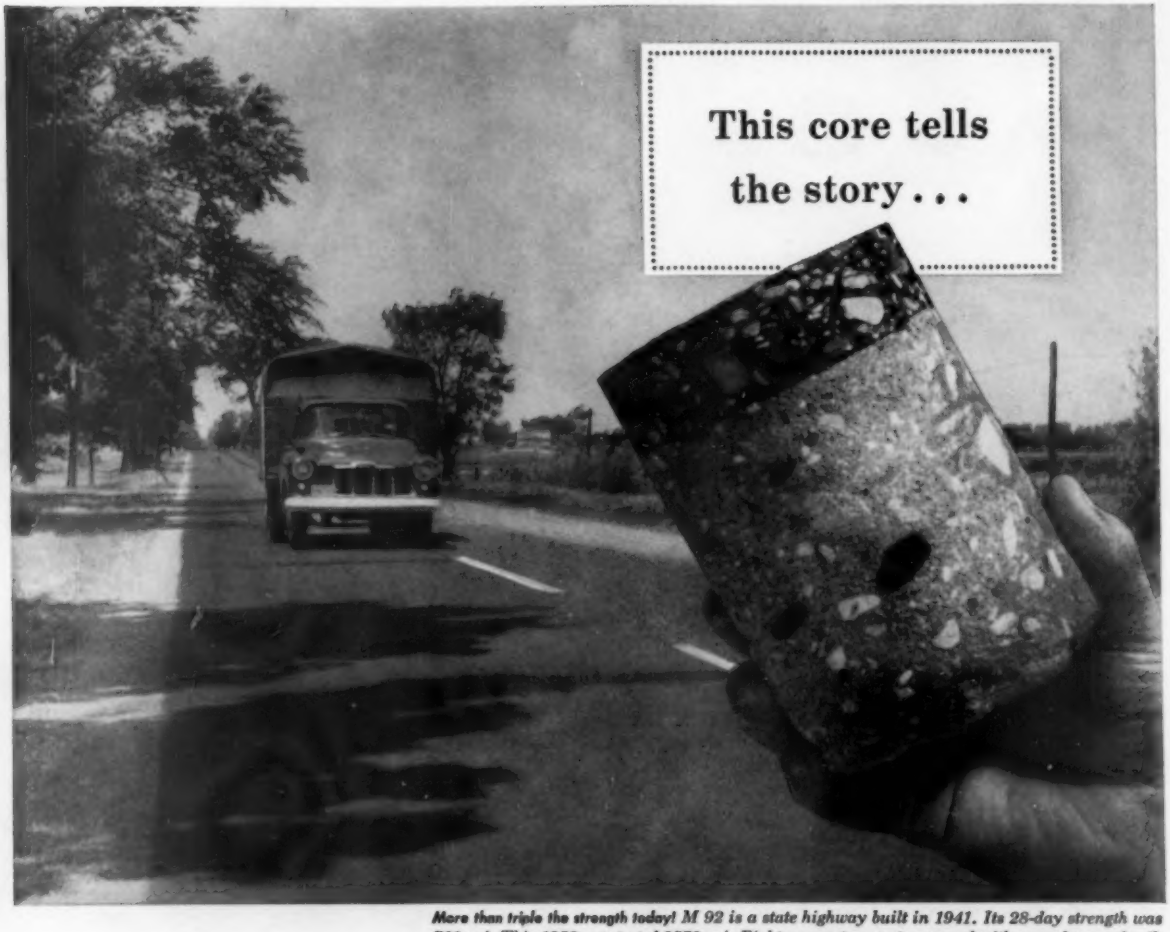
Reo's revolutionary new Flywheel P.T.O. brings to transit mix operators a "*bonus*" *payload increase from 400 to 600 lbs. per trip*— actual weight savings in a 6½ cu. yd. mixer unit resulting from the elimination of separate engine power.

Also eliminated are the headaches of separate service and maintenance requirements.

Reo engineered and installed as an integral part of the chassis engine drive, the Reo Flywheel P.T.O. supplies the mixer with a lighter and more efficient new source of power—smooth . . . even flowing . . . direct.

Most important, operators can have the "bonus" payload advantage of Reo's new P.T.O. at a low initial cost of equipment. Now available in Reo's rugged "C" Series line of transit-mix trucks. Another product of Reo's creative engineering skill has been added to the many important values found only in Reo Trucks. Reo Division, The White Motor Company, Lansing, Michigan.

Gold Standard of Values



More than triple the strength today! M 92 is a state highway built in 1941. Its 28-day strength was 760 psi. This 1958 core tested 2570 psi. Eight per cent cement was used with a sandy gravel soil.

17 years on Michigan's route M 92

...soil-cement pavement grows stronger year by year!

Here's more proof that soil-cement is the long-lasting, durable, low-cost pavement, stretches road budgets—pleases taxpayers.

Soil-cement is low cost because 75% of your materials are usually free. Use almost any kind of soil—plus portland cement. Even gravel or blacktop from old roads can be mixed right in. Top with a thin bituminous surface.

This is a *precision-built* pavement that grows stronger with age. It's stronger inch for inch than any other paving material short of concrete. And its beam strength spreads the load over the subgrade. No potholes, washboarding or soft spots. Maintenance costs stay low.

Developed in 1935, soil-cement is serving today on more than 12,000 miles of roads. And engineers everywhere are converting more mileage to soil-cement each year. Write for free booklet, "*Essentials of Soil-Cement.*" Distributed only in U.S. and Canada.

It's the lowest-cost precision-built pavement for:

ROADS • STREETS

SHOULDERS • SUBBASES

AIRPORTS • PARKING LOTS

MODERN soil-cement

PORTLAND CEMENT ASSOCIATION

Dept. 2-28, 33 W. Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete

A "No. 1, No. 2" combination with 2 bracket shanks—rated at 31%. Working in sandstone—note the fine breakage for scraper collection. They put about 600 yd/hr. Pit had to be shot in previous years.

RESCUE BY RIPPING

Continued from page 52

The cost of full replacement given here is based on use of rebuilt parts since the economy of such replacements is now well-established.

In setting up a system for establishing ripping costs, the track assembly life for non-ripping tractors was taken at a normal 2,500 hours. (Recent improvements now indicate over 3,000 hours.) The worst condition encountered in severe, continual ripping resulted in an assembly life of 500 hours. Between these two extremes, then, wear periods of 2,000 hours, 1,500 hours, and 1,000 hours were given ripping classification of *easy, moderately hard, quite hard* respectively, and the 500 hour period *very hard.* Many checks made have somewhat vertified these classifications, mostly ranging in the 1,000 to 1,500 hour range.

The only way to indicate what costs might apply to what tractor, is by making points of comparison upon and between the two tractors with which we generally operate.

For a D8 class of tractor, appriximate hourly track assembly costs are as follows:

Cost for 2,500-hour normal life $1.25

Easy ripping for 2,000-hour assembly life. (For ripping 30¢ per hour added to normal cost) ..$1.55

Moderate for 1,500-hour life (80¢ added) $2.05

Quite hard—for 1,000-hour life ($1.75 added) $3.00

Very hard—for 500-hour life ($4.85 added) $6.10

For a D9 class tractor, approximate track assembly costs:

Cost for 2,500-hour normal life $1.70

Easy ripping for 2,000 hour life (45¢ per hour added to normal cost) $2.15

Moderate—for 1,500-hour life ($1.15 per hour added) $2.85

Quite hard—for 1,000-hour life ($2.55 per hour added) $4.25

Very hard—for 500-hour life ($6.80 added) $8.50

After the non-ripping full hourly cost is established, add a track cost for ripping according to the difficulty of the job. To this new cost should then be added the expense of teeth. Variations are tremendous but the following hourly costs are approximate.

Easy—about 6-hour life, $4.00

Moderate—3-hour life, $8.00

Hard—1½-hour life, $16.00

Very hard—¾-hour life, $32.00

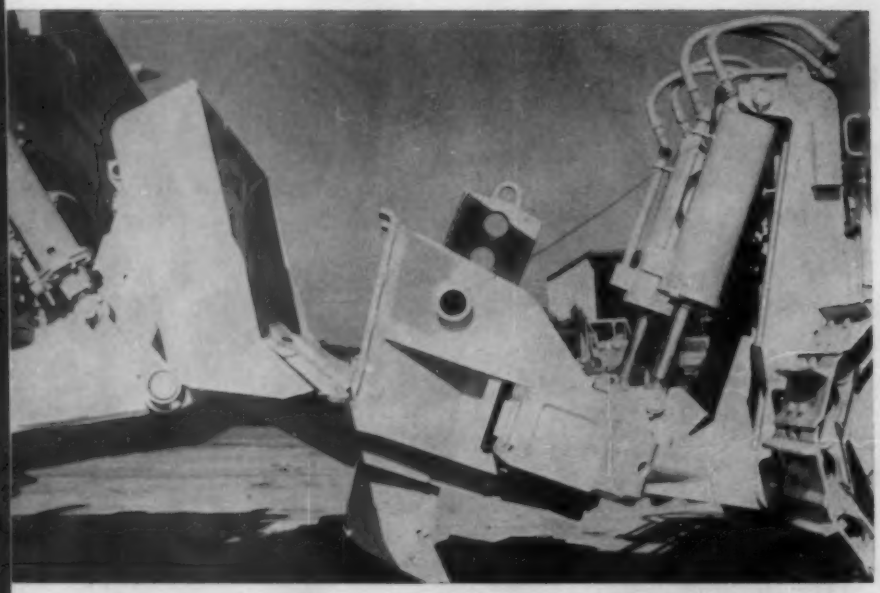
A typical figure would develop about as follows with a D8 class of tractor in *moderately hard going:*

Full, basic ownership and operating cost	$17.00
Add for track assembly	$ .80
Add teeth for teeth	$ 8.00
Approximate Total	$25.80

At 200, 300 or 400 cu. yd. an hour—all are possible yardages—the costs per yard would run 12.90¢, 8.60¢ and 6.45¢ respectively. The highest is cheaper than good shooting costs, by more than one-half, and gives a good indication of the probable costs of this process. The increasing wear and costs to which tractors will be subjected in ripping, will be in direct relation to the hardness and/or abrasion of the material worked. There are operational procedures, however, to be discussed further on in this article that will materially reduce machinery expense.

How much ripped rock per hour? At this point, a contractor is probably asking, "How much yardage do rippers turn out in the form of properly shattered rock each hour?"

Widening experience indicates that as little as 200 cu. yd. an hour per tractor should be acceptable. There is an instance in which a single large tractor using one tooth was laboring hard to get 150 cu. yd. per hour. A second tractor was



Showing how the rear blade is used to help force the tooth (or teeth) downward into the rock. It is downward or penetrating pressure, rather than forward power, which makes the big difference in rippability.

placed with it in true tandem manner and production jumped to 500 cu. yd. an hour. Let's say the one tractor was costing $35 an hour. The cost of ripping was 23-⅓¢ a cu. yd.—a good reasonable cost! With the two machines costing a high estimated $60 an hour, the final cost was 12¢ a yard. In the above manner, the tandem technique created another 11⅓¢ profit per yard, while also reducing tractor wear. Too, tandem production created a much more favorable economic situation in the over-all costs of the job.

Profitable Procedures. There are many things to consider in judging the feasibility and good application of a ripper. Very important, of course, is the proper choice of a machine and its use. Equally important are some of the techniques of its handling. The degree to which rock can be ripped depends, also, upon many things. It is felt that a series of questions and answers will help clarify some of the problems involved.

Q. What constitutes good ripping practice?

A. Good practice is concerned with using the ripper at the proper time, place and in the proper manner. A ripper in indicated when scrapers cannot pick up their loads easily, in suitable quantity, in economical periods of time. A suitable quantity should be about the net load weight in pounds—in exact proportion to the loading power in pounds—in periods not in excess of a minute and preferably not less than 0.6 to 0.7 minute (these requirements to utilize all of the power, capacity and costs involved to their most economical advantage).

Q. What is considered acceptable production, and cost per yard?

A. As long as a ripper, singly, or in tandem, is producing 200 cu. yd. an hour, or more, it is judged unlikely that any shooting-shovel-truck combination will improve on ripping-scraper costs.

If more yardage an hour is required, it would become necessary to use two ripper outfits or a couple of large drilling-shooting outfits plus a large shovel and trucks. If the large shovel group is chosen, a single drill rig and crew would likely need to work two hours for each hour of shovel excavation. In this misguided fashion a higher over-all yardage cost would develop, and a profitable possibility would be turned into an unfruitful effort.

In any event, if ripping and scraper excavating will be given the same control and planning necessary with shooting-shovel-truck work, the over-all cost will be substantially less. Hundreds of cost comparisons point to ripping in difficult conditions, as ranging not in excess of one-third to one-half that of shooting. In good conditions the differential is still more in favor of ripping.

Q. What size tractor best—and why?

A. The biggest and best is always the proper choice unless continuing low yardage requirements make the high rate of attainment unnecessary. A big machine will do more work cheaper than will the next smaller machine; and, working easier, will cause less mechanical abuse.

A big ripper might conceivably produce as much yardage as the next smaller machine and, too, have spare time to act as a pusher.

Q. What ripper type and size?

A. The integral rear-mounted hydraulic ripper is now considered capable of much more work with the same tractor than is the towed type. There are good reasons for this choice. The integral unit is close-mounted to the tractor for quick and efficient retraction, or for powerful, down-pressured ripping. In its largest form, a single tractor has a work range greatly in excess of towed types of rippers except

Continued on page 98

Now Dodge builds 'em extra-big... GAS OR DIESEL... G.V.W.'s to 53,000 lbs.!

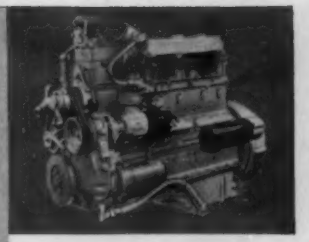
You're looking at a totally *new* kind of Dodge truck. Big, yet its short 89¾" bumper-to-back-of-cab dimension keeps it agile and easy to handle. Compact, yet its exclusive Servi-Swing fenders make it easy to service.

A truck quality-built for *toughest* construction jobs!

1960 Dodge Cab-Forwards offer new gasoline V-8 engines and four big Cummins diesels. Strong new heat-treated chrome-manganese frames, aluminized mufflers, big 14- and 15-inch clutches. And a whole line of new transmissions, with up to 20 speeds forward!

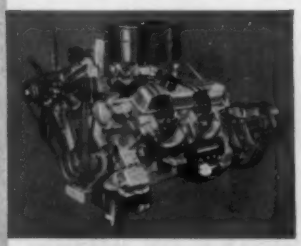
Big choice of models includes tandem and single-rear-axle types. Many wheelbases of ideal length for dump, rock and mixer bodies. Tractors, all the way up to 76,800 lbs. G.C.W.!

Check the new Dodge "big ones" now. Your Dodge dealer's is the place . . . and delivery is quick!



CUMMINS DIESELS are now available in Dodge for big fuel savings and extra stamina in construction hauling. Four engines available, with displacements from 464 to 743 cu. in.; horsepower to 220; torque to 605 lb.-ft.

SERVI-SWING FENDERS . . . Newest idea in engine servicing! Just flick a latch and these fenders open outward, making the engine easy to reach from either side. Check oil, water, battery without raising the hood!



NEW GAS V-8's, with 361- and 413-cu. in. displacements, deliver up to 228 horsepower. They're packed with premium features, such as tri-metal bearings and oil cooler, to insure peak performance and long life.

DEPEND ON
DODGE
TO SAVE YOU MONEY IN
TRUCKS

A PRODUCT OF CHRYSLER CORPORATION

. . . for more details circle 291 on enclosed return postal card

Comparative Tractor-Ripper Workpower

	Teeth Width (inches)	No. 1 tractor with hydraulic integral mounted ripper (and preferably a hydraulic 'dozer).		No. 2 tractor with hydraulic integral mounted ripper (and preferably a hydraulic 'dozer).	
No. Tractor with hydraulic bullozer as pusher (and preferably a hydraulic ripper)	3	*1 tooth 116%	....	1 tooth 97%	2 teeth 49%
	3½	1 tooth 100%	2 teeth 50%	....	....
	4	....	....	1 tooth 73%	2 teeth 37%
	4¾	1 tooth 73%	2 teeth 37%	....	....
No. 1 Tractor with cable controlled bulldozer as pusher (and preferably a hydraulic ripper)	3	....	....	1 tooth 52%	2 teeth 26%
	3½	1 tooth 62%	2 teeth 31%	....	....
	4	....	....	1 tooth 40%	2 teeth 20%
	4¾	1 tooth 45%	2 teeth 23%	....	....
No. 2 Tractor with hydraulic bulldozer as pusher (and preferably a hydraulic ripper)	3	....	....	1 tooth 78%	2 teeth 39%
	3½	1 tooth 83%	2 teeth 42%	....	....
	4	....	....	1 tooth 58%	2 teeth 29%
	4¾	1 tooth 61%	2 teeth 31%	....	....
No. 2 Tractor with cable controlled bulldozer as pusher (and preferably a hydraulic ripper)	3	....	....	1 tooth 48%	2 teeth 24%
	3½	1 tooth 58%	2 teeth 29%	....	....
	4	....	....	1 tooth 36%	2 teeth 18%
	4¾	1 tooth 43%	2 teeth 22%	....	....
No pusher	3	....	....	1 tooth 39%	2 teeth 20%
	3½	1 tooth 50%	2 teeth 25%	....	....
	4	....	....	1 tooth 29%	2 teeth 15%
	4¾	1 tooth 37%	2 teeth 19%	....	....

*Not presently available with a 3-in. tooth.

RESCUE BY RIPPING

Continued from page 96

those occasional "giant" models which must weigh as much as 35,000 lb. to be comparable. The relative price is greatly in favor of the back-mounted ripper.

The ripper bar should be fitted with a bracket and shank capable of being used as the shelf for a hydraulic dozer-tractor-pusher helper. An effective shank-holder of this character is made by the author's company.

Q. Use one, two or three teeth?

A. This depends on the material and whether one or two tractors are used. As harder materials are encountered, one tooth after another is dropped until only one is in use. After this, the tandem application—after this, shooting. A tandem couple can, obviously, handle two teeth in about the same material density as one tractor can handle one tooth. The yardage produced by two teeth will exceed that produced by one tooth, and may well be the deciding factor in choice of number of teeth.

Q. Curved or straight shanks better?

A. Generalized practice indicates that the straight shank will rip harder material than the curved. This is partially because of the difference in the angle of entry. The curved shank generally unearths boulders better, and in some laminated materials creates better breakage. There are advocates for each.

Q. What width tooth is best?

A. Commensurate with its ability to withstand breakage, the narrower the tooth, the better the penetration. Since penetration is the most necessary performance feature of successful ripping, the narrow tooth may create it, whereas the wide tooth or dull one on the same tractor may fail to rip. The narrower teeth will wear faster but their performance can readily justify their extra cost.

Use the blunter tooth if it rips satisfactorily, but keep in mind the better performance of the narrower tooth if the other reaches a point of failure. The higher unit pressure of the narrow tooth may make the difference between accomplishment

Continued on page 103

Now "trade" dead weight for payload..and haul 40% faster!

Heap-load the big-target Payhauler body in minimum time. Strong rock-ribbed corrugations absorb shock—resist wear and distortion. Choose the "95" with power-shift Torque-Converter, or 9-speed air-shift transmission.

New strength-multiplying corrugated body design results in payload-gaining weight reduction of both International Payhauler models. New "95" capacity is increased to 27 tons—and the new "65" becomes the only 19-tonner on the market!

Look at those exclusive, rock-ribbed body corrugations! International applies this strength-multiplying principle to reduce Payhauler® body weight by an amazing 30%! You "trade" 2½ tons of power-wasting dead weight for 3 bonus tons of payload capacity in the new 95 Payhauler!

New high-torque, high-output diesel power highballs 27-ton payloads up to 40% faster than the former "95" could haul only 24 tons! The new 375 hp DT-817 International diesel engine gives the new 95 Payhauler the wallop of 40 extra turbocharged "horses."

Prove to yourself that top load-carrying capacity plus top power-to-weight ratio give 95 Payhaulers tremendous profit-earning advantages. Add up other big Payhauler exclusives: fast reverse, up to 7.1 mph. for spotting speed; big-target bodies for loading zip; 11-second inverted-hoist dumping; load speeding safety of torqmatic braking and positive power-steering! Let your International Construction Equipment Distributor demonstrate!

International® Construction Equipment

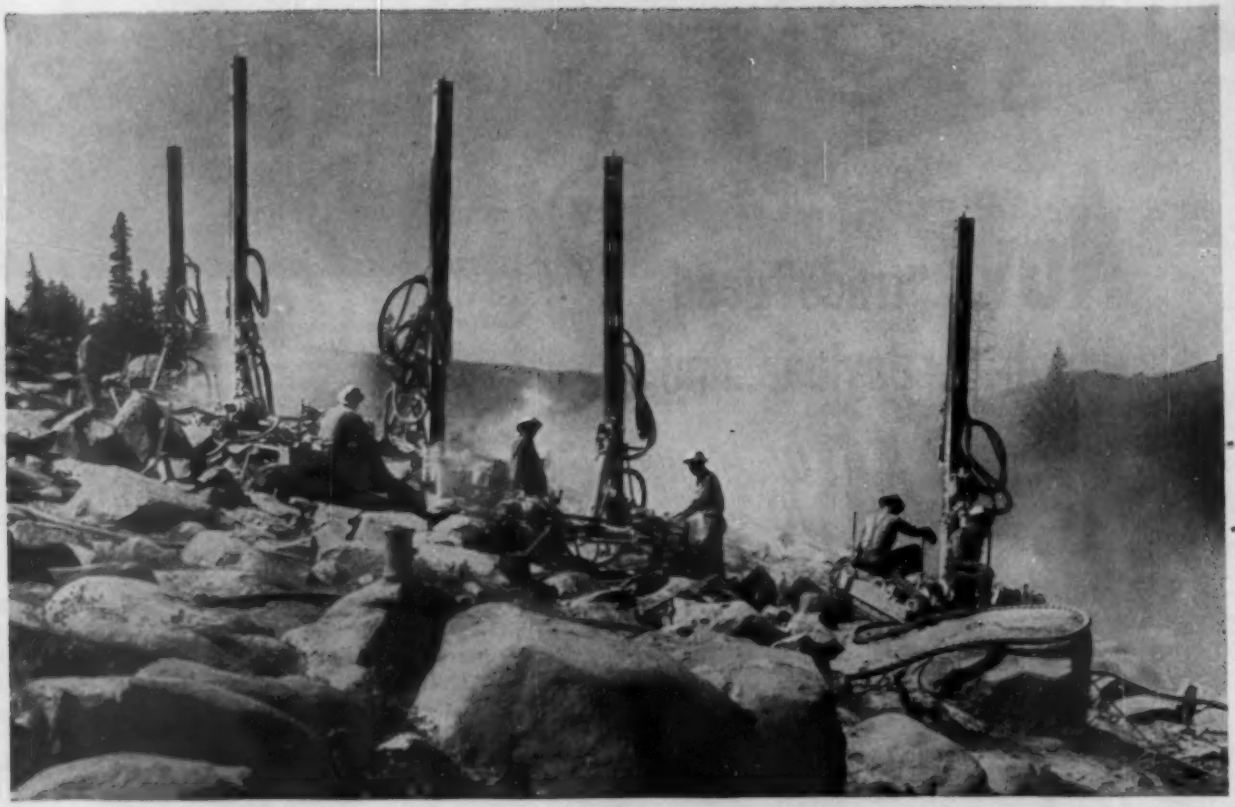
International Harvester Co., 180 N. Michigan Ave., Chicago 1

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

. . . for more details circle 319 on enclosed return postal card

Speeding the pace of highway, pike and pass

—GARDNER-DENVER



SERVICE CLOSE AT HAND

Wherever Gardner-Denver equipment goes, parts and service facilities are always close at hand. Skilled, factory-trained service specialists take pride in keeping Gardner-Denver equipment productive. At Gardner-Denver *there's no substitute for men*—our 100-year philosophy of growth.

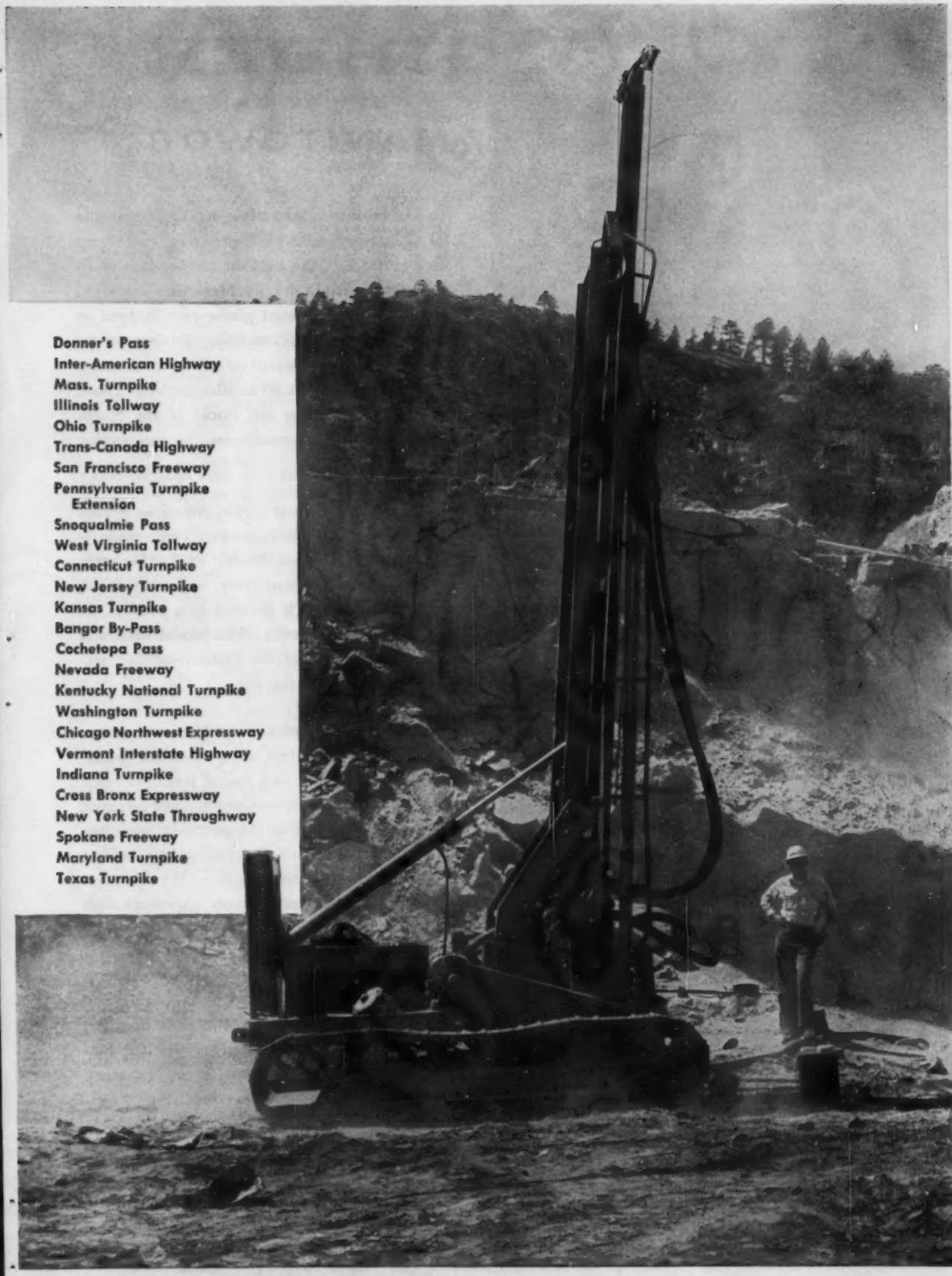
Gardner-Denver — the No. 1 choice in compressors . . . rock drills . . . and air tools

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario



Donner's Pass
Inter-American Highway
Mass. Turnpike
Illinois Tollway
Ohio Turnpike
Trans-Canada Highway
San Francisco Freeway
Pennsylvania Turnpike Extension
Snoqualmie Pass
West Virginia Tollway
Connecticut Turnpike
New Jersey Turnpike
Kansas Turnpike
Bangor By-Pass
Cochetopa Pass
Nevada Freeway
Kentucky National Turnpike
Washington Turnpike
Chicago Northwest Expressway
Vermont Interstate Highway
Indiana Turnpike
Cross Bronx Expressway
New York State Throughway
Spokane Freeway
Maryland Turnpike
Texas Turnpike

187-TON GIRDER

SET BY THIS MANITOWOC

Backbone of a new triple-decked intersection for Chicago's Northwest Expressway is a 187 ton steel girder . . . the heaviest single piece of its type ever erected in the city. Measuring 126′ x 13′, this is the heaviest steel girder ever shipped in one piece by the American Bridge Division of the U. S. Steel Corp. Mounted on reinforced concrete piers, it will support 60 smaller girders. These, in turn, will support ten tracks of the North Western Railroad carried over the intersection at this point.

To handle the giant girder, American Bridge used the largest capacity crawler crane made — a 125 ton Manitowoc Model 4000. The great capacity of the big Manitowoc was a key factor on the project which entailed lifts such as 95 tons at a 25½ ft. radius. The Model 4000 was equipped with 80′ of the Manitowoc "T" section style boom for the job.

Adjacent to the job site the Manitowoc crane placed the girder on two 100 ton railroad "push" cars which carried it on a special length of track to a point alongside the concrete support columns. After lifting one end of the girder in place, the big crane inched through a passageway under a temporary construction track to set the other end of the girder in place. In every respect a tough job in tight quarters.

For a detailed report on the 125 ton capacity Manitowoc Model 4000 see your Manitowoc distributor soon. Only the Model 4000 does the "impossible" by handling lifting jobs that formerly required two or more rigs. No other crawler crane can match this record!

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
25 TON - 125 TON	1¼-YD. - 6-YD.	1¼-YD. - 6-YD.	1¼-YD. - 3-YD.

. . . for more details circle 329 on enclosed return postal card

Table A–Mechanical Requirements for Best Ripping

1. Use the two biggest, single-engine, direct-drive tractors.

2. Fit each with narrow blade (preferably) hydraulic bulldozer.

3. Fit each with integral, back-mounted, hydraulic rippers, without teeth or shanks. Strengthen and gusset the structures properly to take the full power of two tractors without damage.

4. Fit one tractor with heavy-duty special pusher and shank bracket fitted into the *center hole* of the ripper body.

5. Fit the other tractor with two of the special brackets, *one at each outside end of the ripper body.*

RESCUE BY RIPPING

Continued from page 98

and failure. The broader tooth produces more and better breakage if it will work satisfactorily.

Q. What are the critical necessities in an area, assuring as much chance to rip as possible?

A. 1. The area should be kept flat and as level as possible, at least on a plane, even if inclined. This assures the creation of every assist presently known.

2. All hard spots should be kept down to the common working level. Work such spots intensely by cross ripping, or even shake them with a small shot if necessary. Once the spots protrude, control over them is lost to ripping.

3. Keep a blanket of broken material over the actual rock requiring ripping. This helps good underfoot conditions allowing virtually full tractor traction. Never strip rock bare. Bring in a scraper load of dirt and spread it first if necessary. Track slippage on bare rock is lost power, maybe enough to prevent ripping entirely. Too, a slipping track wears out quicker.

Q. Deep or shallow ripping?

A. Deep ripping has its place, but it is not felt to be nearly as effective for scraper work as shallow. Work diagrams show the need for more horsepower and weight as ripping depths increase. Shallow ripping, not to exceed 18 in., creates finer material, allows faster and less obstructed travel, does not hang up the tractor as readily, sets up as much or more yeardage hourly, gives momentum and shock a better chance to add their tremendous power. Tests with buried obstructions have shown impact to submerged tooth points exceeding 300,000 lb.

The lessening in repairs to tractors, scrapers and tires, in finer well-broken material is also a factor to consider.

Q. Should one tractor—or two in tandem—be used?

A. If one tractor will rip easily, without the track spinning and/or halting travel, there is little need for two. A tandem hook-up, however, will produce more yardage with two teeth than one tractor with one tooth. There is little reason why a well set-up machinery spread should be without two tractors; if two will do a better job of ripping, they should readily be available. No unusable attachments are necessary. If fitted properly, having them does not impair the normal activity of either machine singly. They merely become a tandem package by the simple process of bringing them together.

It is believed that cheaper ripping can be accomplished with tandem machines, even in material a single tractor could handle, because of their greater rate of accomplishment.

Q. What material classifications indicate rippability or its impossibility?

A. Classifying rock geologically does not indicate its response to ripping—nor with what tool. Some very hard formations rip – other softer ones will not. Sandstone will generally break up well, but some refuse to submit. Granular-but-hard rocks often rip easily because of the loose-knit structure. Laminated formations tend to rip well. Most any rock readily scored by a knife will rip.

Some rock, mostly homogeneous, will call for extremely high down-pressure on the ripper tooth but require less drawbar for forward travel. Others require excesses of drawbar to break through hard spots, but can do with less penetrating power. Of the two, down pressure or drawbar pull, the down pressure is much the more important.

Shallow ripping can be done with less drawbar, provided there is enough down pressure to create entry into the material. This means that, normally, where ripping becomes impossible, a substantial increase of weight over the ripping point will bring about results otherwise impossible.

Experience is the only means of telling what must be done if an impasse is reached. Lacking trained consultation, the contractor's only means of knowing whether a rock body can be ripped or not is to get the best tools, equip them as here suggested, use them according to the book, and hope for the best. You can always shoot! Even if it costs twice as much as ripping!

A few good gimmicks are adding to the efficacy of ripping—in some conditions – such as the wings mounted at the heels of ripper shanks. Follow the basic character of the rippers here discussed, and their use, and there is little reason for anything but success in a wide range of application.

Judging the Ripper Application. Judging the fitness and ability of rippers to work is not the job for a novice. Neither is it within the capabilities of the experienced always to be sure of results when the point of impossible performance is near. Geological idiosyncrasies have a way of upsetting the best opinions of even the experts. The variety of tools available, their respective performance, and how used, often make assured results problematical.

A fairly recent assist in analyzing rippability of rock is the portable refraction seismograph. It is an excellent aid to the experienced rock-ripping consultant but in other hands can be questionable. There is little chance of going wrong in judging easily ripped rock, but in questionable area approaching rip-

ping failure, it takes extensive ripper experience to be right.

Even at this point, there is the need for correlation between seismic interpretations and ripper experience in order to designate the proper tool, its correct shank and teeth, and the proper use procedure. Much of the seismograph's value is in indicating densities of out-of-sight materials.

Evaluating tractor workpower. An attempt has been made to evaluate the relative working capacities of the most popular machines presently available including ensemble variations. The workpower of each combination varies, as does the same machine with different shanks and/or teeth. The lb. per sq. in. pressure on the tooth area now seems the most logical approach to respective work capabilities.

You must create penetration as you move forward. Otherwise you only scratch. If you can penetrate, most any normally used power will pull you through it. Thus a combination of down pressure and forward pulled power does the actual work, and yet the workpower is not a full combination of the two, nor is the resolution of the two forces a correct means of judging workpower.

It is felt that the actual down pressure in the tooth is the best and most indicative. This is because there is generally enough drawbar pull for any attained down pressure using presently available tractors. Tooth areas range from about 3 in. to 4-¾ in. wide; and the metal thickness from a tapered point may be ⅛ in. to 1½ in. A mean thickness for calculating is taken at one inch.

Since several currently used tractors have integral mounted rippers, and many towed types are pulled by them, a simplified means of distinguishing a work range must be set up. So, let us call the biggest, heaviest, most powerful tractor presently available a Number 1. The next size range, and most generally found, we will call a Number 2. The only difficulty in establishing these classifications for all tractors is the fact that the tandem arrangement has only been applied to one make. Too, there may be some differences in the hydraulic systems of different machines and a corresponding change in down pressures and tractor drawbar. There is no reason, however, why the basic principles and relations here enumerated cannot indicate what is to be done to any tractor to bring about corresponding results.

The best performing package—a tandem—is given a rating of 100 percent to which all other combinations refer. The relation between other combinations must be figured if desired. For instance, a No. 2 hydraulic ripper with 3 in. tooth and a No. 2 hydraulic bulldozer is rated at 78 percent. Thus, a No. 2 hydraulic ripper with 3 in. tooth and No. 2 cable dozer rated at 48 percent has but 61.5 percent as much theoretical workpower as the No. 2 with hydraulic No. 2 dozer-pusher, etc. Towed rippers have a potential workpower in relation to those herein listed according to their weight and tooth width. A so-called heavy-duty towed unit weighing about 14,000 lb. with a 4-in. tooth would have a normal rating of about 18 percent on the chart.

Better, smaller teeth may become available, or even may be obtained on occasion now. In such a case, the performance of any machine may be improved in terms of rock penetration beyond the figures shown for a wider tooth. An instance is shown where a 3-in. tooth, if it could be obtained for the No. 1 —No. 1 combination, would improve the penetrating power over the 3½ in. tooth by 16 percent. These figures will, without a doubt, be changed up or down slightly. Meantime, this is the nearest thing to any known relative ratings and is acceptably correct.

Table B—Recommended Job Procedures

1. Keep area to be ripped, level, or on a plane if inclined.
2. Never allow hard spots to protrude above the common level.
3. Never strip rock bare. Always leave a blanket of broken or ripped rock over underlying solid formations. Bring in a load of dirt and spread over it if necessary. In this manner, maximum traction and workpower is assured.
4. Rip shallow.
5. A stalling ripper is an inadequate one. Use as large a tractor or tractors as needed to maintain a constant speed and higher production.

Unless operators comply with *all* the suggestions governing the choice and use of rippers and their fittings, these figures will not apply and there would be no means of attempting comparative analyses. Any ripping assembly less than the best will always do less work—costing more, of course.

Caution to tandem users. *Do not attempt tandem ripping until your rippers are prepared properly.* A general strengthening with gussets, plate and extra welds is necessary in areas which will be affected by the rack and strain of two tractors' entire power output. When this is properly done, there will then be no undue breakage. Little extra expense is involved in preparing the two tractors.

The best way is to have two identically prepared tractors, except that one has but a single tooth with pusher-shelf mounted in the beam center. The other has two pusher-shelves on the beam (one at each outer end). Each tractor should have a hydraulic bulldozer. Then each becomes interchangeable as the lead machine in tandem use. The only extra expense involved in this arrangement is a few hundred dollars for the special bracket-shank-pusher shelf-tooth holders, above the price of standard shanks and holders.

Alone, either tractor is an individual machine capable of the many job duties of dozing and ripping. Together they form the most powerful work combinations yet conceived. There are no periods of costly idleness for such machines, as are invariable for drilling equipment. No expenses accrue for idle

Continued on page 123

With the new streets—curbs and sparkling, silicon carbide-impregnated sidewalks of modern concrete

For 43 blocks of downtown streets, Abilene chose CONCRETE

...the pavement built to stay put for 50 years and more!

In an all-out fight against "downtown blight", Abilene, Texas, modernized the entire business district with all new concrete streets in one giant renewal project.

Abilene shoppers and shopkeepers alike can expect a whole lifetime of enjoyment from their new, attractive concrete streets. Pavement is six inches thick with cement-treated subbase.

The new streets won't be blocked off for expensive surface build-up treatments every few years or torn up for major repairs. Even on the hottest days concrete doesn't get soft, tacky or slick. Traffic can't push its solid surface into ripples and washboards.

There are no "moving parts" in concrete to cause hidden wear. In fact, concrete grows stronger year by year. That's why engineers predict today's modern concrete pavements will far outlast any other type, serve 50 years and more!

Concrete pleases taxpayers, too. Maintenance costs run so low that the moderate first cost isn't just a down payment. Even on street lighting money is saved. Concrete reflects light, so fewer fixtures are needed. City electric bills go down.

Cities everywhere with urban renewal problems are going to concrete. It's the first big step in an effective modernization program.

"The 'new look' of our downtown business district is causing plenty of excitement in and around Abilene!"

Says HENRY NABERS, *Abilene City Manager*

"Our bright new concrete streets and sidewalks are helping to bring shoppers back downtown. Business has really improved since the dedication ceremony.

"The durability of concrete and the low upkeep costs make it the best investment. The good experience with Abilene streets paved with concrete as far back as 1924 helped convince us of that."

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

SAFE ALL AROUND!

180° SPEED SWING

ALL-PURPOSE MATERIAL HANDLER

No other equipment in the material handling field offers as much *all-around safety* as the Pettibone 180° Speed Swing!

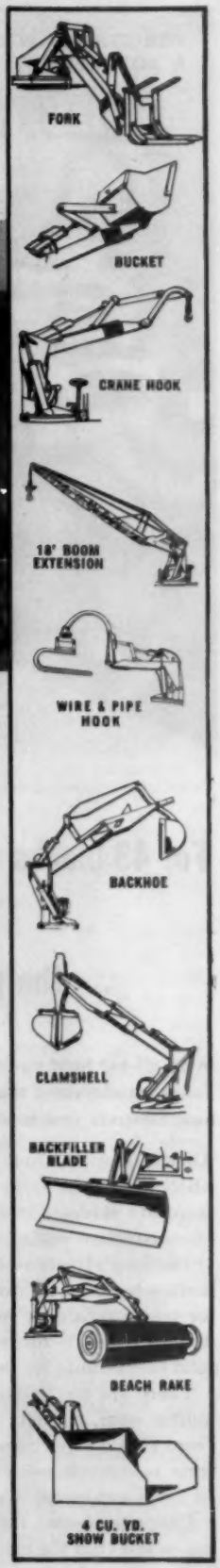
The exclusive Pettibone 180° boom swing permits the operator to load either alongside or in back of trucks. The long boom is located forward, keeping the bucket far out in front of the operator to provide fullest protection from spilled loads. There are no side arms to endanger the operator, as with other loaders. Also, being closer to the ground and with no obstructions around the seat, he can get on and off the machine easily . . . from either side!

Because of its 180° swinging boom, the Speed Swing is not forced to maneuver back, forth, and all around constantly when loading. It SWINGS THE LOAD instead! This means far *fewer* machine movements and *faster* work cycles . . . with *greater safety* to other workmen, other equipment, and to moving traffic on streets or highways.

The long boom reach prevents bumping trucks when loading from side or rear. Other type equipment cannot provide this high safety factor. Also, the longer wheelbase, wider tread, and low center of gravity mean more stability and greater safety in moving heavy loads.

And there's *full* operator visibility for any one of the 10 *quickly-interchangeable* attachments shown at right, at all times during use. To top it off, you make the *safest investment of all* when you choose the Pettibone 180° Speed Swing . . . the most outstanding all-purpose material handler for ALL YOUR JOBS!

Find out all about it today. Get all the facts on how to safeguard your profits, your working crews, your investment in equipment—and be SAFE ALL AROUND! Write to—



PETTIBONE MULLIKEN CORPORATION

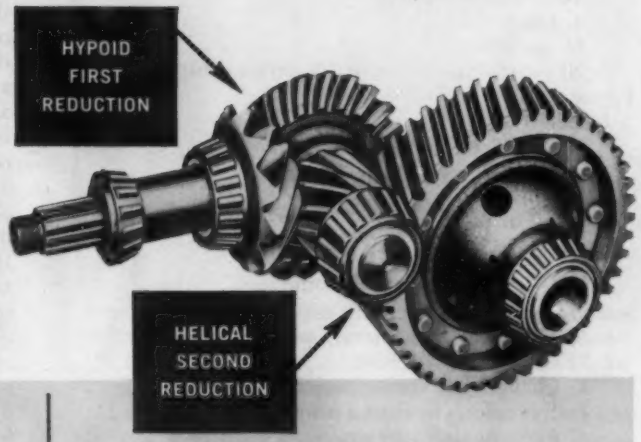
4700 WEST DIVISION STREET • CHICAGO 51, ILLINOIS

. . . for more details circle 336 on enclosed return postal card

Heavy-Duty Hauling Jobs Are Easy With Timken-Detroit®

BALANCED HYPOID-HELICAL DOUBLE-REDUCTION AXLES

Timken-Detroit balanced hypoid-helical double-reduction gearing is unequalled for top performance and dependability. Outstanding advantages that make it the choice of heavy-duty equipment manufacturers and operators are: big, husky gears . . . greater flexibility in gear ratios . . . balanced gear set loadings . . . long life and low maintenance costs. The hypoid first reduction is 30% stronger than spiral bevel, and works in series with the second reduction to take an equal share of the load. In the helical second reduction, strong helical gears with a wide range of ratios insure balanced double-reduction gearing.



240 SERIES
SINGLE-SPEED, HYPOID-HELICAL DOUBLE-REDUCTION

Two full-sized gear sets form a balanced power train—with each gear set accomplishing a substantial reduction. This combination of husky hypoid first reduction gears coupled with rugged, wide-faced helical second reduction gears provides a double-reduction gear set that outperforms all others. Because the ratios of each reduction may be varied, you get a balanced power train with the larger selection of axle ratios for maximum operational versatility and performance.

340 SERIES
TWO-SPEED, HYPOID-HELICAL DOUBLE-REDUCTION

A true two-speed axle which provides two separate gear ratios through the use of two full-size helical gear sets . . . a "fast" ratio for maximum speeds and a "slow" ratio for greatest pulling power. Pick the most efficient gear ratio to meet your requirements of speed, load and road. Spring-flex power shifting provides simple, positive shifting with either air, vacuum or electric actuation. Timken-Detroit two-speed hypoid-helical double-reduction axles give a versatility and economy to trucking operations that is unmatched by other axle gear designs.

choice of two—

INTERCHANGEABLE BALANCED DOUBLE-REDUCTION DRIVES

Another Product of...

ROCKWELL-STANDARD CORPORATION

ROCKWELL R STANDARD

Transmission and Axle Division, Detroit 32, Michigan

. . . for more details circle 340 on enclosed return postal card

CONSTRUCTIVE COST CONTROLS

Continued from page 53

d. Specific performance regarding
1. Sequence of operations
2. Liability and coordination with others
3. Starting and finishing dates

2. Directions by 'Owner' or representative
a. Inspectors
b. Architects or engineers

Obtained by:
1. Competitive bidding
a. Open
b. Selective
2. Negotiations with owner or prime contractor

Payments:
1. Progress
a. Partial holdback
b. Variable holdback
2. Supplementary
3. Total or lump-sum

Secondary Income

Sources:
1. Smaller jobs with private parties
2. "Extras" resulting from
a. Changes in existing projects
b. Extension of existing project
c. Additional nearby projects
3. Salvage resulting from recovery and sale of surplus materials and equipment
4. 'External' transactions (i.e., 'Return on Investment") with outside firms.
a. Lease or rental of services, equipment & property
b. Sale of equipment, materials and property
5. 'Internal' transactions similar to Source 4. *but* with the transaction being between two or more divisions of the same organization.
6. Commercial operations not related to construction
a. Investment of capital in other enterprises
b. Diversified non-construction operations
1. Examples—Mining, oil wells, transit mix concrete, aggregate production, building materials sales, etc.

Defined by:
1. Refer to "Definition—Primary Sources of Income

Obtained by:
1. Principally through negotiations with Owner

Payments:
1. Accepted commercial practices

Reviewing these sources of income shows of course that the main streams of revenue for the typical roadbuilding contractor are generated either as a prime (principal) contractor or as a sub (specialty) contractor doing work according to plans and specifications, as interpreted by the 'owner's' representative. Because so much of this work is done for public agencies, the possibilities and potential value of actively engaging in some of the secondary sources of income are sometimes given only very limited consideration.

However, there are at least three important general reasons why these "secondary" sources should never be completedly discounted or overlooked. In order of discussion they are (1) Advantages in working with private parties, (2) Diversification and flexibility, and (3) Greater utilization of personnel and equipment.

Although private work tends to be smaller, volume-wise, than public jobs, the contractor often reports a higher percentage of net profit. Also fewer job headaches. This helps to offset the disadvantage of smaller work volume in such jobs. At times, too, the contractor will obtain more realistic cooperation from the owner's representatives (often the owner himself!) because a private owner may appreciate the value of getting a job done quickly and well according to good construction practices instead of being bound to special standards or elaborate specifications on quality and workmanship.

Diversification and the accompanying attribute of flexibility or being able to successfully handle more than one kind of work at a time (or separately), are always assets to any contractor. In roadbuilding this is especially true because designs, specifications, methods and equipment are continually changing. Therefore contractors must not only be aware of such changes, but whenever possible should also be acquiring a practical understanding of what these new developments involve in terms of actual production costs.

Therefore, by removing self-imposed restrictions on bidding certain types of work because they are "too small" or "we don't have any experience in doing that kind of work", or some other reasoning, the aggressive contractor is refusing to wear any mental "blinders". He is facing the future squarely, with his eyes open for opportunities to expand.

Coinciding with being able to obtain greater diversification and flexibility is the very significant advantage of having greater utilization of personnel and equipment. Being able and willing and getting a larger variety of work, means that a contractor is not apt to overlook any sudden opportunities to pick up some "side change" because he regarded any adjacent work as being beneath his dignity. Such an approach carries with it the further benefit of being able to obtain more days per year of actual use time for his equipment and fewer lay offs with a steady increase in steady and competent men while at the same time helping to develop better supervisors and work teams.

For reasons such as these, many contractors have found that while the "big" jobs may provide the means to support their companies, the rate of their advancement and volume of dividends can often be measured by the volume of work which can be classified as "secondary income".

Another place where "omitted income" can occur is in connection with profit evaluation. The principal reason for the existence of a roadbuilder is the same as for most other commercial enterprises—namely, to make a profit. Allowing for the occasional individualistic enterprise which is satisfied with the status quo, the successful firms are likewise "growth minded" or anxious to obtain a steady in-

crease in net profits.

Such an increase in net profits can come from only two interrelated sources (1) a larger percentage of profit or return on the firm's operations and (2) a larger volume of profitable operations. Since these are both dependent on income it is important for alert construction executives to continually review and evaluate their sources of income according to acceptable standards of profit such as the following ratios or percentages of profit.

1. Overall Profit Ratio—or percentage of gross profit (before taxes) compared to total income from
   a. A specific project
   b. A number of jobs of a given class of work (Average Profit Ratio)

This particular analysis indicates the value of engaging in a given type of work. However, it should also be used as a means of signalling when other fields should be considered.

For example let a yield of 10 percent from city street work be accepted as a satisfactory return. Then due to competitive pressure let this drop to only 8 percent and result in a 20 percent cut in profits—what is indicated?

Any such serious reduction in net profits naturally calls for a closer review of costs. If costs are found to be in line, then under tight bidding it would be worth while to explore other available types of work, according to such criteria as these:

1. Comparing current units prices on other construction work with similar unit prices for city street work.

2. Analysing the *number* of bidders on other types of work and also on other projects of a different volume or value. It may be possible for a contractor to spot areas where he has a better "chance" of winning an award.

Still other ratios which have been used as indicators of operations are these:

II Ratio of Profits to Labor Costs

III Ratio of Net Profits to Corporate Worth

If sufficient reader interest is indicated, these and still other measures of business performance can be further discussed in subsequent articles.

In summing up this discussion it can certainly be said that "omitted income" represents sources of income and therefore potential profits which have been either disregarded or overlooked. Because the purpose of cost control is to reduce expenses and increase profits we have discussed this phase of this very broad and important subject first in order to present one of the first axioms of cost control which states that: "Omitted income means loss of profits."

Biggest Fob Collection?

Every equipment operator who sports a watch fob, or collection of them from the machinery manufacturers, will get a kick out of the fobs owned by Larry Yartz of West Sunbury, Pennsylvania. This enterprising young fellow has 612 of them on display.

Many of the fobs depict heavy construction equipment, some dating away back. The boy's family helped him get started with this unusual hobby. Some of the older fobs include one from Good Roads Machinery Company dated 1915, and one from Bascom Rope Company, 1909. The oldest item, 1893.

Larry Yartz and his fob collection.

Larry would like to hear from readers who have old fobs or who share this hobby interest, and so would the Editors. Drop us a line and we will forward your letter.

Cement Association Creates Advanced Engineering Group

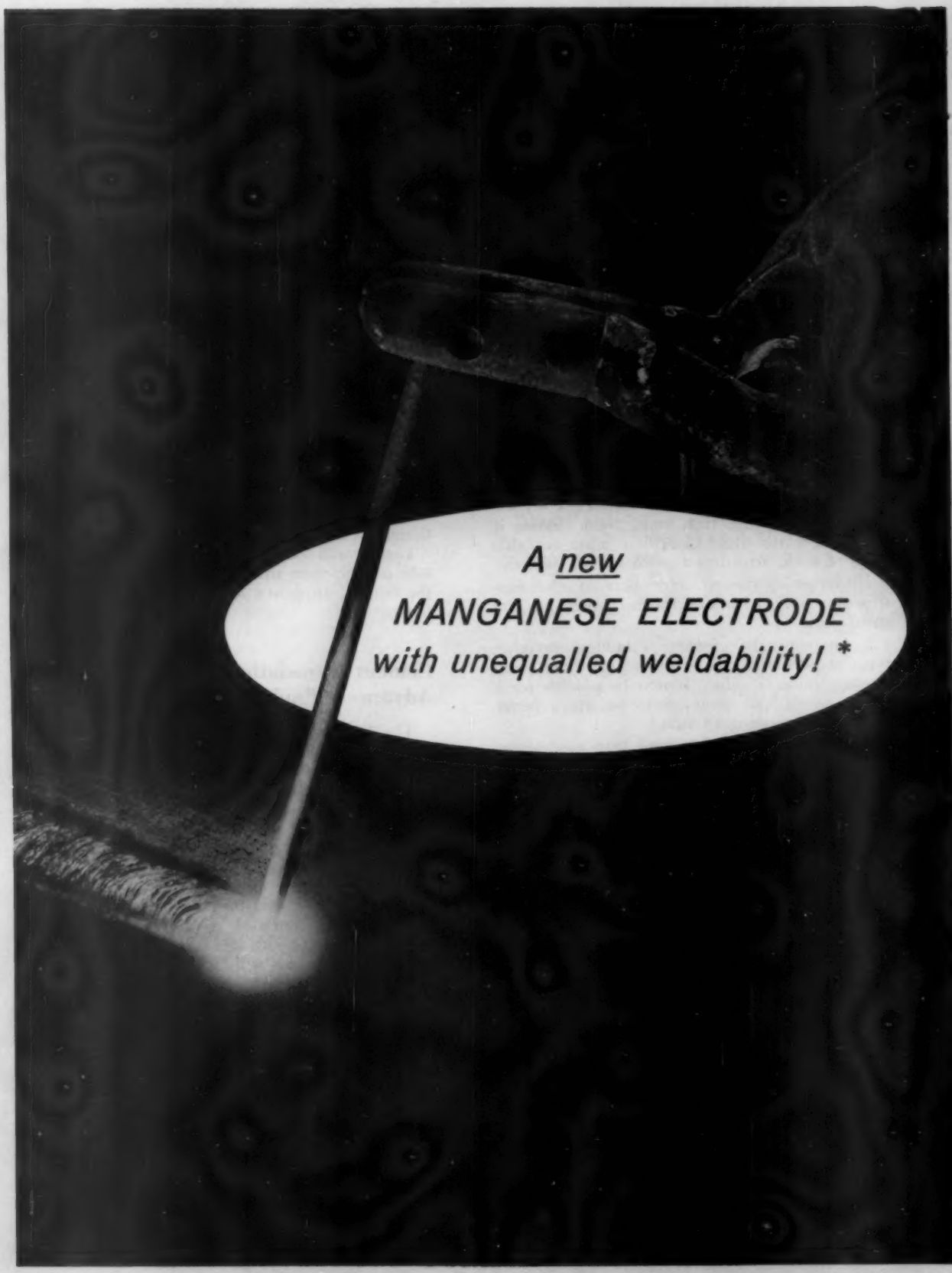
The Portland Cement Association announces formation of an Advanced Engineering group at its general offices in Chicago. It will be headed by Alfred L. Parme, nationally known structural engineer.

G. Donald Kennedy, president, described the new group as a "highly specialized unit, bringing together unusual engineering talent for the development of basic engineering data." Its purpose will be "to apply the most advanced engineering, mathematical and physical principles, and the most modern test data, to achievement of even more efficient use of concrete in all of its many applications."

The group, which will include an electronic computer specialist and draftsman in addition to engineers, will draw upon investigations of the Association's $10 million Research and Development Laboratories at Skokie, Illinois, and will maintain close working relationships with PCA's extensive technical staffs at Chicago headquarters and 33 district offices.

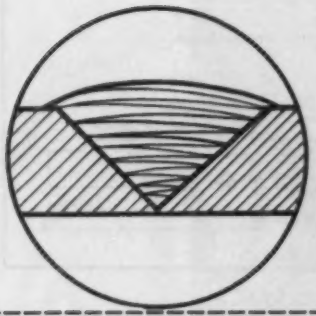
Methods of design of various structures will be studied by the new group. Significant foreign developments will be reviewed, specialized computer programs originated, and advancements in various fields of concrete use analyzed as to their most effective application.

Parme's former position as manager of the Association's Structural and Railway Bureau will be filled by Walter E. Kunze, formerly assistant manager.

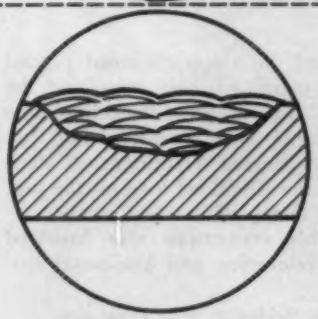

A new
MANGANESE ELECTRODE
with unequalled weldability! *

STOODY NICKEL MANGANESE

WITH IRON POWDER COATING



FOR JOINING



FOR BUILD-UP!

New Stoody Nickel Manganese electrodes solve manganese welding problems in the field or in the shop! You'll find it unexcelled for joining manganese parts or building up worn areas on manganese equipment. Stoody Manganese is now produced as a solid core wire on which the alloying elements in an iron powder coating are extruded. Unusual welding properties are obtained *with physicals unexcelled in the industry!*

Call your Stoody Dealer—check the Yellow Pages of your phone book or write for list of dealers serving your area.

FEATURES:

Stable arc—No popping	Freedom from cracks
Easy re-strike	No porosity
Fast deposition	Easy slag removal
Low spatter	Clean deposits

Cores are uniformly straight and coatings perfectly concentric—insuring a stable, smooth running arc.

Ask your Stoody Dealer for test samples...check speed and welding qualities, *test performance against every other manganese electrode you've ever used...* you'll find Stoody Nickel Manganese provides something *new* and *needed* in the industry!

PHYSICAL PROPERTIES:

(Based on tests by independent laboratory)

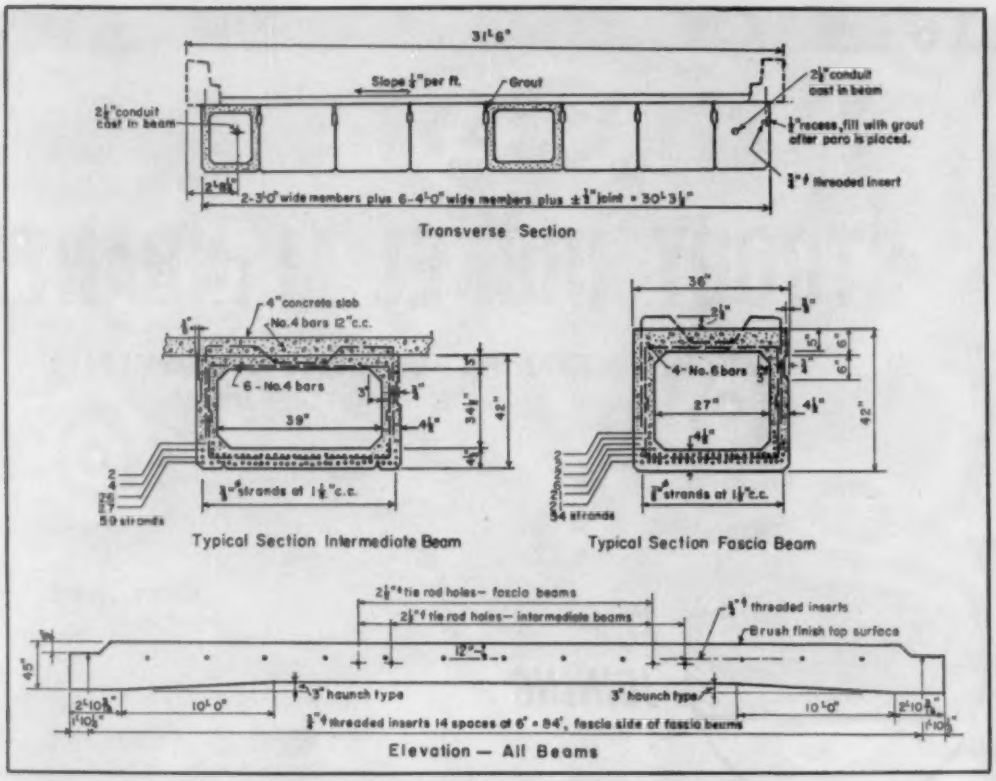
	DC Straight Polarity	DC Reverse Polarity
Tensile Strength	119,000 psi	111,000 psi
Yield Strength	67,000 psi	66,000 psi
Elongation in 2"	55%	37.5%

Hardness—Single pass on manganese steel;
as deposited—15 Rc, as work-hardened—48 Rc.
Two passes on manganese steel;
as deposited—18 Rc, as work-hardened—48 Rc.

*Be sure that your Maintenance Superintendent and Welding Foreman see this announcement!

STOODY COMPANY
11908 East Slauson Avenue
Whittier, California

. . . for more details circle 346 on enclosed return postal card



Intermediate beams for Bridge No. 8. These beams are 48" wide x 42" deep by 88 ft.

7 PRESTRESSED BRIDGES

Continued from page 56

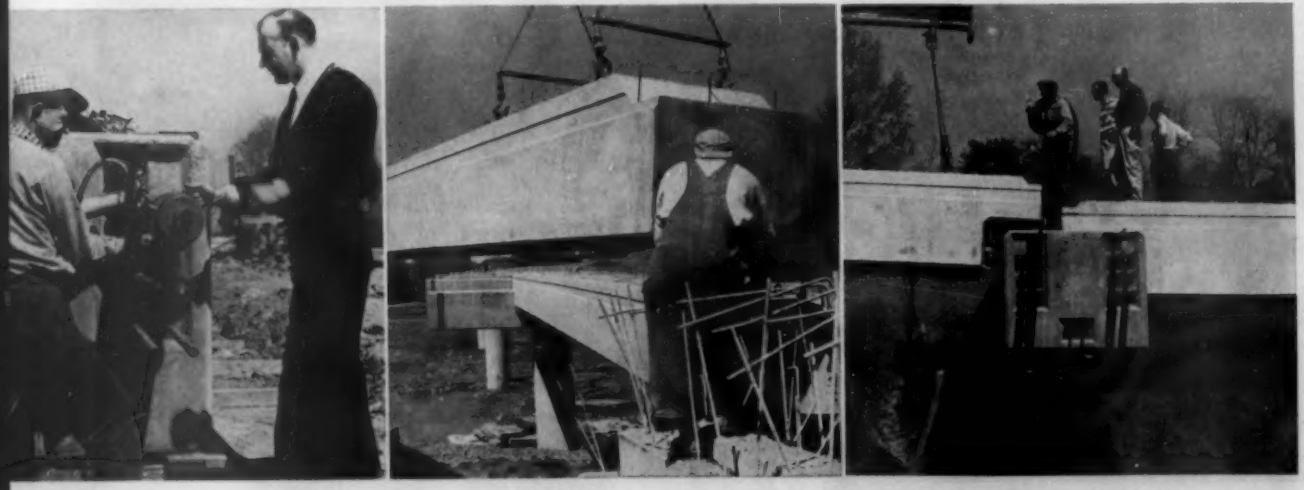
were used on the deck concrete to comply with the specification for saturated cover curing.

Three of the bridges are 65'6" wide, facia to facia. One is 107'6" wide. All but two of the structures are wide enough for four traffic lanes with raised median strip 4-ft. wide rather than having twin bridges for two roadways.

Unusual problems were encountered on Bridge 4. Clearance and surface elevation were critical both under the deck and under the pier caps. Minimum construction depth was obtained at the piers through use of the aforementioned precast post-tensioned pier caps and by notching the end of the beams. The tendons were post-tensioned on stages during placement of deck beams as the dead load on the pier caps increased.

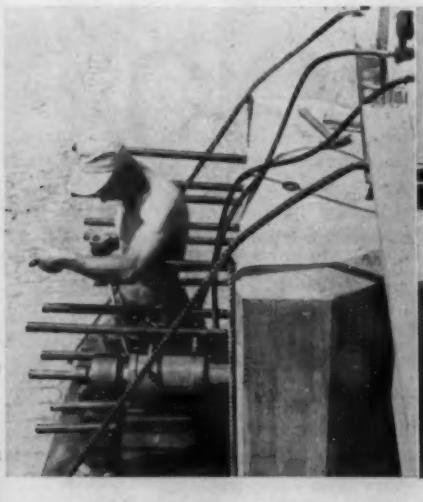
This structure also involved superelevation and horizontal cur-

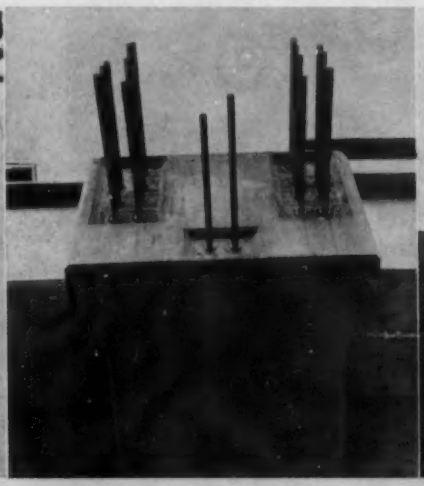
(Left): Post-tensioning a cap beam in place, Bridge No. 4. (Center): Setting beam for Bridge 4; note grout slot details. (Right): How beams were notched for end spans, Bridge 4.



Again the paired cranes do the setting—pier caps for Bridge 4.

Additional views of pier cap, Bridge 4—being post-tensioned; after post-tensioning completed; and during grouting.

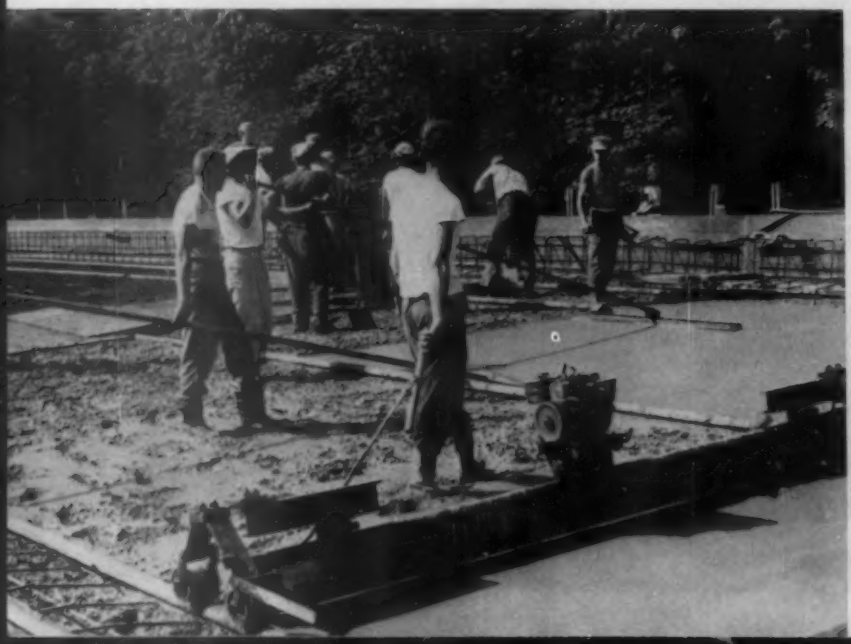




Another of the seven bridges—No. 8, with 92 ft. clear span made economic by the prestressed design.

How precast pier cap was trundled from nearby casting bed.

Concrete deck slabs for all bridges were finished by hand-drawn vibratory screeds. Note reinforcing in position on far side for walkway and parapet.



vature. Both ends of the beams were skewed to meet the line of piers. Beams on the inside of the curve were naturally shorter than those on the outside of the curve. Thus the facia members form chords of the radius. The curb and parapet were formed and cast in place to conform to the roadway curvature.

Lengths of the various bridges varies from one to six spans. Bridge lengths and number and dimensions of beams required were:

Bridge 1—Five spans, total 446 ft.
28 intermediate beams, 4′ wide, 42″ deep, 74′ 3″ long.
4 facia beams—same dimensions.
42 intermediate beams, 4′ x 42″ (or 45″) x 97′ 10″
6 facia beams—same dimensions.
Bridge 2—One span, 57½ ft.
16 intermed. beams—4′ x 27″ x 52′3″
Bridge 3—Three spans, 205½ ft.
28 intermed. beams—4′ x 33″ x 59′8″
4 facia beams—4′ x 42″ x 59′8″
14 intermed. beams—4′ x 42″ x 82′5″
2 facia beams—same dimensions.
Bridge 4—Six spans (Curved creek crossing) Length 483 ft.
84 intermediate beams—4′ x 42″, average length 79′6″
12 facia beams—same dimensions.
Bridge 5—One span, length 53 ft.
24 intermed. beams, 4′ x 21″ x 47′8″
2 facia beams—same dimensions.
Bridge 6—Four spans, total length 210 ft.
12 intermediate beams—4′ x 21″ deep x 41′1″
4 facia beams—4′ x 33″ x 41′1″
12 intermediate beams—4′ x 33″ x 61′10″
4 facia beams—same dimensions.
Bridge 7—(Steel. Not here described)
Bridge 8—One span, length 92 ft.
6 intermediate beams—4′ x 42″ (to 45″ haunch) x 88′0″
2 facia beams, 5′ x 42″ (to 45″ haunch) x 88′0″

Acknowledgement

The bridge designs were checked by the Pennsylvania department of highways bridge staff, K. H. Jensen, state bridge engineer, and Heinz Koretzky in charge of prestressed structures. Russell Strohm was project manager for C. J. Lengenfelder & Son, with Harold Critchfield, bridge superintendent, and Louis Feher, office manager.

The beams were hauled by trailer and dolly by C. H. Zern of Gilbersville, Pa. and were erected by Lyons Steel Erecting & Rigging Co. of Camden, N. J., under subcontract from Langenfelder.

RESCUE BY RIPPING

Continued from page 104

time which must rightfully be charged as extra expense to those times when the machine does work.

The largest machine will always do more ripping cheaper than will its smaller counterpart, so by its inclusion in a work spread the contractor will always have the best and won't have to wonder if something else *might* have done the trick. If a tandem combination such as herein discussed cannot "hack it," the contractor "has had it."

Hydraulic dozers are staging a well-deserved comeback these days, so have one in your spread. Any two tractors equipped, as here indicated, constitute the only perfect tandem pair. If you don't need to rip tandem because your rock is not hard, each machine works out its prescribed duties without loss of efficiency because it is potentially one of a tandem team. To realize the difference between a true tandem pair and just a pusher, refer to the table again—say a No. 1 tractor pushed by a No. 2, with a cable controlled blade. Refer this couple to two No. 1's with full, hydraulic equipment. 58 percent is the best answer you can get.

Let it be said again, judging the complete range of the rippability of rock is not a job for the novice. Only a few people presently, for instance, can guess at the outcome of applying the biggest tandem ripping package.

If you're equipped as this article suggests, however, and follow the well-founded principles included, you can bet no one else is able to rip where you find it impossible.

Equipped as Table A, two tractors are set up to cover about 5 degrees of ripping difficulty.

(1) One tractor alone with two teeth for very easy ripping.

(2) One tractor alone with one tooth for a little harder work.

(3) A tandem operation for two tractors with the front ripper with two teeth submerged, pushed by the rear ripper with one tooth in the ground, for fairly easy and highly productive going—may be turning out a thousand ripped yards an hour.

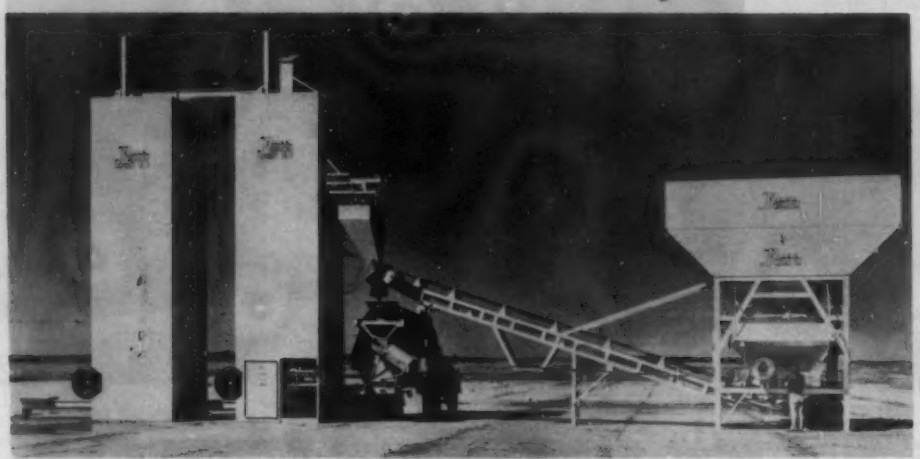
(4) Tandem, with the front tractor, two teeth sunk with the second tractor pushing, with the *single tooth in the air*—ripping, possibly, 500 cu. yd. an hour—or more, quite easily.

(5) Tandem, with the single tooth ripper in the front pushed by the two shank ripper-tractor with the *two teeth in the air* in the rear. This for the hardest going—turning out possibly no more in extremely bad going than 200 cu. yd. per hour.

Combining the given potential rates of performance with the possible costs of the tractors involved, will give you the surprising figures of really low-cost rock breakage. From this great range of ripping difficulty can be met, with varying degrees of performance. Down pressures on ripper teeth ranging from about 4,000 to over 15,000 psi (more if teeth are sharp) can be expected. Tractor drawbar from 50,000 up to 130,000 lb. is available for combining with down pressures.

If the going gets really difficult, don't compromise and expect results! Follow the suggestions to the "letter" and you will shatter rock cheaper than you've ever done it before. At present, beyond this point you can't hope to rip. Blast it!

STATIONARY CAPACITY plus PORTABILITY



ECONOMY

HIGH PORTABILITY

STATIONARY CAPACITY

The new Ross 60-3 high-capacity portable batching plant and two highly portable 350-B Bucket Elevator Cement Silos gives the industry the answer to the search for portability with stationary capacity. Designed for legal highway travel, the Ross plant can be in operation within a few hours of arrival at the jobsite and can be disassembled and moved in less time.

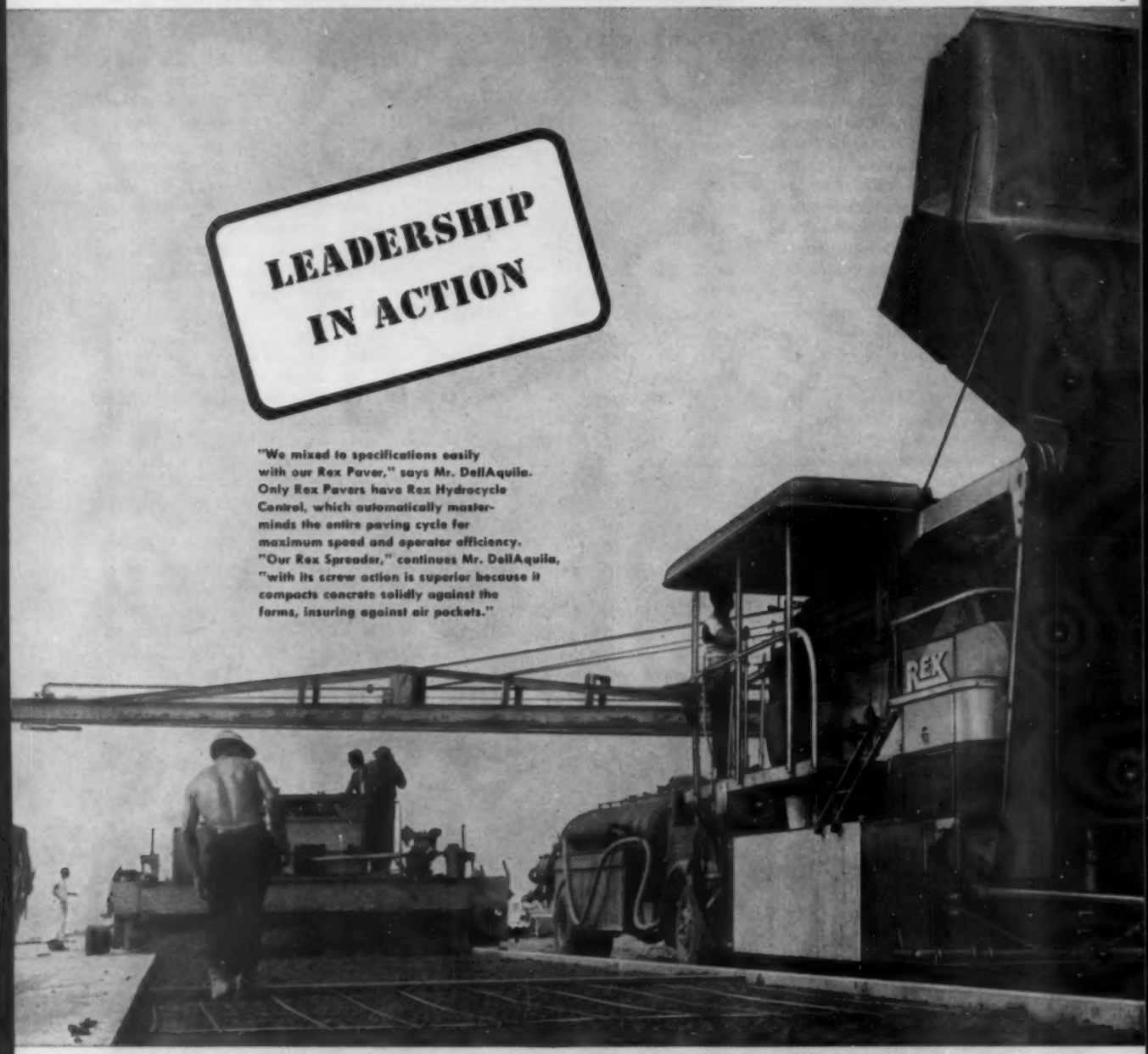
ROSS . . . AMERICA'S MOST IMITATED PORTABLE BATCHING EQUIPMENT
CONTACT US FOR THE NAME OF THE DEALER NEAREST YOU

ROSS PORTA-PLANT
BOX 446 PHONE MI3-4356 BROWNWOOD, TEXAS

PORTABILITY IS NO SIDE LINE WITH US

. . . for more details circle 341 on enclosed return postal card

"With our new REX Paving Spread


LEADERSHIP
IN ACTION
"We mixed to specifications easily with our Rex Paver," says Mr. DellAquila. Only Rex Pavers have Rex Hydrocycle Control, which automatically masterminds the entire paving cycle for maximum speed and operator efficiency. "Our Rex Spreader," continues Mr. DellAquila, "with its screw action is superior because it compacts concrete solidly against the forms, insuring against air pockets."
REX

your nearby **REX** DISTRIBUTOR

ALABAMA—Leary & Owens Machinery Co. Birmingham • Leary & Owens Equipment Co., Mobile-Montgomery

ARIZONA—Road Machinery Co., Phoenix-Tucson

ARKANSAS—Lyons Machinery Co., Little Rock

CALIFORNIA—Cal-Rex Machinery Sales, Los Angeles • Coast Equipment Co., San Francisco

COLORADO—Booth-Rouse Equipment Co., Denver

CONNECTICUT—The Holmes Equipment Co., Hartford-Norwalk

FLORIDA—M. D. Moody & Sons, Inc., Jacksonville-Tampa • Blanchard Machinery, Inc., Miami • Blanchard Machinery of West Palm Beach, W. Palm Beach

GEORGIA—Sim Grady Machinery Co., Macon-Savannah-Atlanta.

IDAHO—Intermountain Equipment Co. Boise-Pocatello

ILLINOIS—Western Contractors Supply Co., Melrose Park • Eighmy Equipment Co., Rockford

INDIANA—Stockberger Machinery, Inc., Ft. Wayne • Power Shovel Co., Inc., Indianapolis

IOWA—Spreitzer, Inc., Cedar Rapids • Gibbs-Cook Equipment Co., Des Moines

KANSAS—The Victor L. Phillips Co., Wichita

KENTUCKY—Contractors Equipment Co., Inc., Lexington-Louisville-Madisonville

LOUISIANA—Wm. F. Surgi Equipment Corp., New Orleans

MAINE—Files and O'Keefe Co., Portland

MARYLAND—McClung-Logan Equipment Co., Inc., Baltimore

MASSACHUSETTS—Powered Equipment Corp., Newton Highlands

MICHIGAN—Contractors Machinery Co., Detroit-Grand Rapids • Lake Shore, Inc., Iron Mountain

MINNESOTA—The Zeco Co., Duluth-Hibbing-Minneapolis

MISSISSIPPI—Southern Equipment & Sales, Inc., Jackson

MISSOURI—The Victor L. Phillips Co., Kansas City • Holekamp Equipment Co., St. Louis

NEBRASKA—Fuchs-Hebert Equipment Co., Omaha

NEVADA—Pioneer Equipment Co. of Nevada, Inc. Reno

NEW HAMPSHIRE—New Hampshire Explosives & Machinery Co., Inc., Concord

NEW JERSEY—Dale & Rankin, Inc., Hanover

NEW MEXICO—Contractors Equipment & Supply Co., Albuquerque

NEW YORK—Contractors Sales Co., Inc., Albany • MacDougall Equipment Co., Inc., Binghamton • P-D Service, Inc., Buffalo-Pavilion • Theodore J. Burke & Son, Huntington, L. I.;-Jamaica • Central New York Equipment Co., Inc., Syracuse

NORTH CAROLINA—E. F. Craven Co., Greensboro-Greenville-Charlotte-Asheville

NORTH DAKOTA—Northwestern Equipment, Inc., Fargo-Bismarck • Northwestern Equipment Co. of Minot, Minot

OHIO—Construction Equipment Corp., Cincinnati • Metro Equipment Corp., Cleveland • Cantwell Machinery Co., Columbus-Luckey

OKLAHOMA—The Victor L. Phillips Co., Oklahoma City-Tulsa

PENNSYLVANIA—Andersen Equipment Co., Bridgeville • Furnival Machinery Co., Harrisburg-New Philadelphia-Philadelphia-Pottsville

SOUTH CAROLINA—Jeff Hunt Machinery Co., Charleston-Columbia-Greenville-Florence

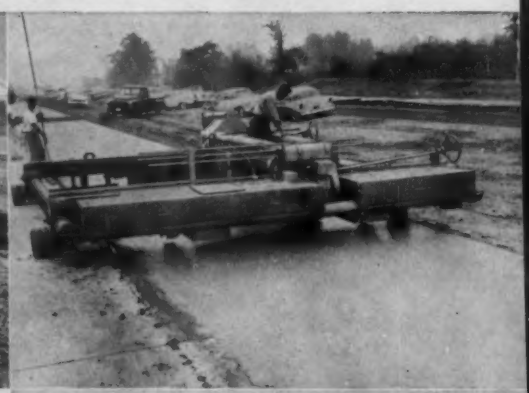
we cut contract time 5 months!"

"We're new in the concrete paving field," says Mr. Nicholas DellAquila, president, Enfield Road Construction Co., Enfield, Connecticut. "That's why, when we took this big job, we had to have the *surest* in equipment performance. After surveying the equipment of the major manufacturers, we realized that our first road venture could be accomplished best by a full line of Rex equipment."

This contractor went after and got a 4½-million-dollar contract—as its *first* entry into the concrete road paving field. The job is Interstate 91 near Thompsonville, Connecticut—six miles of divided highway with 12-foot-wide, 9-inch-deep, double-lane slab.

To safeguard its venture, a complete Rex Paving Spread was put on the job, supplied by a fully automated Rex Road Batching Plant.

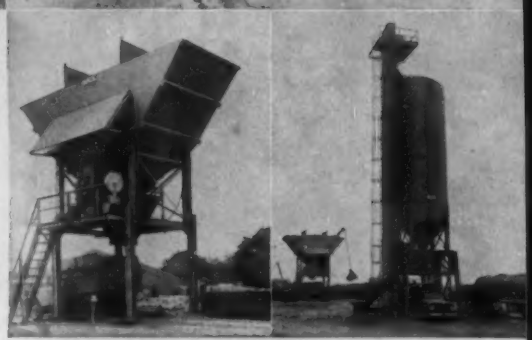
With the 6-mile contract finished, production and performance of the Rex equipment speeded up completion five months ahead of schedule. Working with a single Rex 34E Paver, Enfield Road Construction Co. easily maintained a 700-cu.-yd.-per-day rate.



(*Above*) Rex Finishers provide rapid finishing action of stiff, low-slump concrete—have a comfortable operator station with grouped controls, perfect visibility.

(*Above right*) "Final finishing by the Rex Longitudinal Float is made at excellent speeds with exact crown accuracy," states Mr. DellAquila. Note rubber wheels on one side for riding completed slab.

(*Right*) Three-compartment Rex Aggregate Bin is automated for fastest, most accurate delivery of aggregates and sand. Automatic batching of exact cement measure is provided by this 850-barrel Rex Bin with push-button automation.



SOUTH DAKOTA—Sheehan-Bartling, Inc., Rapid City-Sioux Falls
TENNESSEE—Nixon Machinery & Supply Co., Inc., Chattanooga-Knoxville • Hawkins Equipment Co., Memphis • C. H. & L. Machinery Co., Nashville
TEXAS—The Roy Klossner Co., Corpus Christi-San Antonio • Conley-Lott-Nichols Machinery Co., Dallas • Contractors Equipment Co., El Paso • R. B. Everett & Co., Houston • Nichols Machinery Co., Longview • Conley-Lott Machinery Co., Lubbock-Odessa
UTAH—Arnold Machinery Co., Inc., Salt Lake City
VERMONT—Reynolds & Son, Inc., Barre
VIRGINIA—Nesbitt Equipment Co., Alexandria • Phillips Machinery Co., Norfolk-Richmond • Shelton-Witt Equipment Corp., Salem
WASHINGTON—Air Mac, Inc., Seattle • Intermountain Equipment Co., Spokane
WEST VIRGINIA—Machinery, Inc., Charleston
WISCONSIN—Hunter Machinery Co., Inc., Milwaukee-Green Bay
ALASKA—Northern Commercial Co., Seattle, Washington

ROAD BUILDERS' LIBRARY of informative picture literature is yours for the asking from your Rex Distributor. CHAIN Belt Company, 4652 W. Greenfield Ave., Milwaukee 1, Wisconsin. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto. Distributors in principal cities of the world.

REX®
CONSTRUCTION MACHINERY

ONE
source of supply—
ONE
manufacturing responsibility—
ONE
complete distributor service

. . . for more details circle 290 on enclosed return postal card

One of California's larger projects—U. S. 99 relocation south of Bakersfield, requiring close cooperation between inspector, testing lab and contractor.

In California where an already large highway program has had to be made still larger, we have had our problems of experienced personnel being "spread too thin." Methods have had to be developed for speeding the development of new personnel and giving more engineers, inspectors and testing men the rounded experience necessary to maintain good inspection.

Some of the features of this effort are outlined, in answer to a query from the Roads and Streets editors:

1. Manuals have been prepared for each department. Their purpose is to help in the downward delegation of authority, ending at the project. The manuals clearly set forth the "ground rules" and standards involved in each of the following fields:

Right of Way, Maintenance, Bridge Planning and Design, Service and Supply, Planning, Materials, Construction Practices, Construction Equipment Practices, and Accounting.

The immediate effect of the recent expansion of the highway program was a severe one on the Construction Department of the California organization. New people had to be found, and everyone

Getting Good Construction —California's Approach

Manuals defining the technology, employe rotation, winter meetings, better field testing, among steps paying off.

By Milton Harris
Construction Engineer, California Division of Highways, Sacramento

given a fresh indoctrination into our specialized highway construction engineering.

2. An employe rotation program, started some years ago, became increasingly important, helping to prevent the siphoning off of personnel to industry as well as give more rounded experience.

This program at first was not mandatory, and was not practiced state-wide. When the accelerated program came nearer, the Employe Rotation Program was made *mandatory* for employes in the Junior Highway Engineering classification. In fact, the next higher classification was termed the *working* classification, and those of the Junior Highway Engineers who are included in the rotation program are considered in a *student* classification.

Many employes, after completing their rotation period, were assigned to work in the Construction Department as Resident Engineers, or other responsible positions in construction.

3. Special attention is given to the development of good Resident Engineers, who make up the hard core of the construction inspection work. A practice started with the accelerated programs is the holding of Resident Engineers' Meetings in the Districts. All Districts now hold these meetings, at which are discussed the "on-the-job problems," improvements, and subjects of general interest.

The meetings are purposely kept informal, and everything is being done to keep the general atmosphere conducive to open discussion for all. For instance, attendance of supervisory personnel is held to a minimum. It has been found that with this practice there is more active participation on the subject being discussed, and additional worthwhile subjects are introduced which might otherwise be repressed.

The spacing of the meetings vary according to the district, and apparent need; some holding Resident Engineers' Meetings monthly, other quarterly, or semi-annually.

As the personnel grew accustomed to these meetings, some of the districts began inviting one or two representatives from other districts (distant, if possible) to further promote exchange of information.

As the Resident Engineer has daily contact with the other engineering personnel on the job, it appears to be the correct level from which distribution of information is most advantageous. The Resident Engineers' Meetings are an outgrowth of the semi-annual statewide meetings of the Operations Engineers (engineers in charge of construction and maintenance in the districts). These are two-day meetings, and are now held once each year.

4. Another approach to the training program has been the following: The Construction Department has two headquarters Specialist Engineers, one concerned with bituminous work, and the other with portland cement concrete pavement. Their duties are to keep in contact with the projects on which the respective types of work are being performed and advise, when needed, as to proper procedures.

During the past year a special course was given in all districts on bituminous work, and also a course on portland cement concrete. The winter season was selected so that a maximum number of the field personnel could attend.

In the case of the bituminous course, the instruction team consisted of a representative of the Division of Highways Personnel Section, our Construction Department Bituminous Specialist, and an Engineer from the Asphalt Institute.

For the portland cement concrete

Continued on page 123

No doubt about it—big trucks make the money where there's sand and gravel to be moved. Zook Brothers Construction Company of Bigfork, Montana, will move more than 90,000 tons during their resurfacing job on the Meriwether Trail. Here one of their Mack B-813SX dumpers takes on a 15-yard load at the gravel plant.

You can put when

Macks have everything needed for dependable, profitable operation in on- or off-highway construction. Maneuverability and ease of handling for fast spotting and dumping. Ability to haul maximum payloads with low operating costs. Mack Balanced Bogie with Power Divider and self-steering design gives outstanding tractive ability and maximum tire life. Only routine maintenance requirements. These are sensible reasons why you can't

Specs for Montana's Highway 28 called for a 5-inch layer of sand as a choker course. Hilde Construction Company of Great Falls found their Mack B-73S dumpers with Balanced Bogie ideal for pulling through the soft surface of the sand pits. Here the Macks move up to the loader.

down roads more profitably you're backed by MACKS

afford to operate anything but Mack trucks.

Your nearest Mack branch or distributor will be glad to give you on-the-job performance figures and the names of Mack users near you. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

2386

MACK
FIRST NAME FOR
TRUCKS

MACK for over 6 straight years NO. 1 by far in sales of diesel trucks

. . . for more details circle 328 on enclosed return postal card

QUALITY AT THE RIGHT PRICE

ROGERS

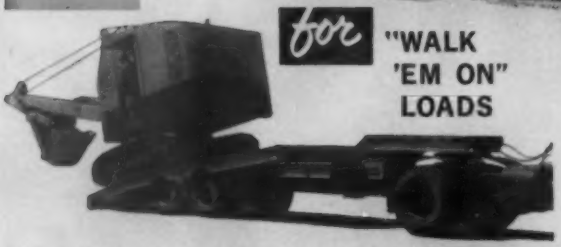
The Original Low Bed Trailer

STILL THE POPULAR PREFERENCE

for QUICK LOADING AND FAST MOVES

The THPG Trailer's Patented gooseneck permits detaching, loading and reattaching in as little as five minutes; or it can travel with the deck above the normal position for increased roadway or below the normal position for decreased overall height clearance.

The hydraulic mechanism is operated by the truck's power take-off or by a gas engine mounted in the gooseneck adapting the trailer to operation by any tractor.



for "WALK 'EM ON" LOADS

Rogers Tilt-Deck Trailers are advantageous for hauling certain types of equipment—they load easily and are built in single and double axle models for varied requirements.

Some units have drawbars; others goosenecks for use with standard fifth wheels.

for GREATEST VALUE

The Rogers TVT Trailer is well named since it presents a value not even approached in any other trailer.

Rogers long experience, specialized engineering talent and uncommon facilities have produced units that have great capacity in proportion to weight, which haul and handle well and brake efficiently. The sloped deck facilitates loading.

for MULTIPLE AXLE REQUIREMENTS

Efficient flotation and equalized loading on all tires are features of Rogers 3-Axle Trailers.

The Drop Deck Model (above) has minimum road clearance and loads quickly over the front by reason of the hydraulic detachable gooseneck.

Rear-axle is removable for shortened wheelbase.

Level deck 3-axle trailers have small tires and a sloping deck to facilitate loading. The entire length of the deck for carrying long equipment.

for "LONG JOHN" LOADS

Rogers Pole Trailers are popular for hauling stacks, tanks, prestressed beams and other long objects.

Drawbar extends to maximum reach or telescopes to minimum length for fast, safe return trips. Removable to meet special requirements as here illustrated.

Available with self-contained power steering for easy turning and maneuvering.

AND for MISCELLANEOUS HEAVY LOADS

The HIGH FLAT made to Rogers high standards, including all wanted features and PRICED RIGHT.

Also available in a 35-ft. trailer that extends to 45 and 55 feet to haul extra long objects.

Experience Builds 'em ROGERS Overweight Trailers Performance Sells 'em

ROGERS BROTHERS CORP.

ALBION, PENNSYLVANIA

EXPORT OFFICE: 50 CHURCH STREET

NEW YORK 7, N. Y., U. S. A. CABLE

. . . for more details circle 338 on enclosed return postal card

CALIFORNIA'S APPROACH

Continued from page 119

course, the instruction team consisted of a representative of the Division of Highways Personnel Section, our Construction Department Portland Cement Concrete Specialist, and representatives of the Portland Cement Association. The courses, limited to one day each, have consisted of illustrated lectures on best methods and equipment to perform the type of work discussed; with open discussion encouraged during any part of the presentation. The courses were well received, and "seconds" were requested in some cases.

5. Our Materials and Research Department at present is conducting a Laboratory Training Program for District and Headquarters personnel. It is intended to be a continuous program. At present is limited to Supervising and Senior Highway Engineers, but will later include other classes. The program is intensive and covers the selection, use, and control of materials used in highway design and construction. Several such week-long meetings have been held to date during the 1959-60 winter.

6. Our department's internal organization set-up, with respect to tightening the chain-of-command on quality control, has been given careful attention.

The Highway Districts, of which there are eleven, are responsible for all construction activities in their area. Specifications, in so far as possible, are slanted towards end results. Headquarters Construction assists the Districts by furnishing information as to acceptable practices, equipment, and methods; and with other departments is constantly attempting to develop and

Milton Harris

Why gamble when you buy used equipment?

When you buy a used machine you expect it to make money for you. And if you don't make money because it "wasn't what the man claimed it to be," you've made a bad deal . . . lost money. But there's no such risk when you buy from a Caterpillar Dealer. Here's why: He reconditions, classifies and guarantees his trade-ins to take the guess and gamble out of your buying. Because he does a lot of trading, he offers a wide selection of rigs—machines you can buy at realistic prices. For example:

1 **A "BONDED BUY"** in used Cat-built equipment is your best buy *anywhere.* This is an exclusive written guarantee bond, up to $10,000, assuring you parts and labor repair protection during the warranty period . . . similar to a new machine guarantee.

2 **A "CERTIFIED BUY"** covers units of any make in good condition. Machines with lots of life and profit left in them. This type of protection carries the dealer's written guarantee of satisfactory performance.

3 **A "BUY AND TRY"** deal is more than its name implies. It means a fair buy for the price asked. You are protected with the dealer's written money-back agreement. Something you won't get at most used equipment lots.

Only a Caterpillar Dealer will provide you with bonded protection, or written protection of any kind. He will also back you with prompt service and parts you can trust. You'll find a Cat Dealer listed in the Yellow Pages. Visit his used equipment lot for the best buys on the market. Compare his values with anyone else's . . . you'll soon join the family of satisfied Caterpillar customers.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST BUYS IN NEW AND USED EQUIPMENT

. . . for more details circle 285 on enclosed return postal card

Plowing an AIRPORT or PARKING LOT, CITY STREET or EXPRESSWAY . . .

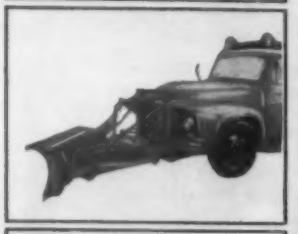
Think of FRINK

—The Plow Designed to Meet YOUR Snow Removal Needs

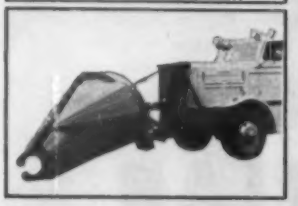
Whether snow removal problems in your area require a high-speed, heavy-duty V-type plow (above) or a lighter, maneuverable Reversible type, Frink has the plow specifically designed to do the job . . . faster, safer, at lower cost.

Frink, the pioneer in advanced snow-plow design, makes four basic types of plow, each with models to fit 1½ to 12 ton trucks . . . and most are interchangeable on same truck attachment. Get full details from your Frink distributor or write Frink for descriptive folders about any of these plows —

ONE-WAY Snow-Plow with Trip Blade
Finest speed plow made . . . tapered, curved moldboard throws and spreads snow to minimize deep banks, yet windrows neatly at city speed.



REVERSIBLE PLOW with Trip Blade
The all-purpose plow . . . throws right or left, or bulldozes straight ahead . . . cab lever sets position automatically, even while plowing.



ROLL OVER Plow with Taper Blade
Made only by Frink . . . can rotate to left or right position in 15 seconds . . . high-speed for deep snow . . . ideal for airports and dual highways . . . ends deadheading . . . easier to park.

V-TYPE Sno-Plow (shown at top)
Rugged powerhouse for heavy-duty plowing . . . self-ballasting to keep nose down, prevent side thrust . . . bevels side banks . . . will not wedge . . . safe at high speed . . . economical in use.

For Snow Plow Know-How It Pays to Think of FRINK SNO-PLOWS

FRINK SNO-PLOWS, INC., CLAYTON, N. Y.
Eastern Steel Products, Ltd., Preston, Ontario-Canada

. . . for more details circle 303 on enclosed return postal card

improve the tools of control. Examples of the latter are:

(a) Titration test for determining cement-aggregate proportions in cement treated base.

(b) Profilograph for determining relative smoothness of constructed pavements.

(c) Adapting specifications for new types and methods of work.

(d) Establishment of a regular state-wide core drilling crew.

(e) Developing a system of control over the time element of a project.

(f) Developing less time-consuming and more comprehensive job record-keeping.

(g) On-the-job radio communication.

Besides the liaison between Headquarters and the District by field trips of the Construction Engineer himself and two specialists previously mentioned, Headquarters Construction has four traveling representatives. These engineers regularly review construction in the districts, and transmit information on new procedures, methods and equipment. They try to keep aware of, and report on, departures from standard practices that may prove detrimental.

Also the traveling engineers assist in any manner in keeping communication lines open, thereby resulting in uniform construction practices on a state-wide basis.

Lateral communication between Headquarters Departments is kept open by a monthly joint meeting between the Construction Department, Design Department, the Materials and Research Department, Office Engineers and others. Mutual problems are discussed and procedures recommended towards correction.

7. Colleges and universities are cooperating in our personnel development program. In 1957 the State Personnel Board established a new Civil Service classification entitled "Engineering Student Trainee," with employment provisions such that bona fide engineering students can be employed in the summer months when the need for additional employes is at its peak.

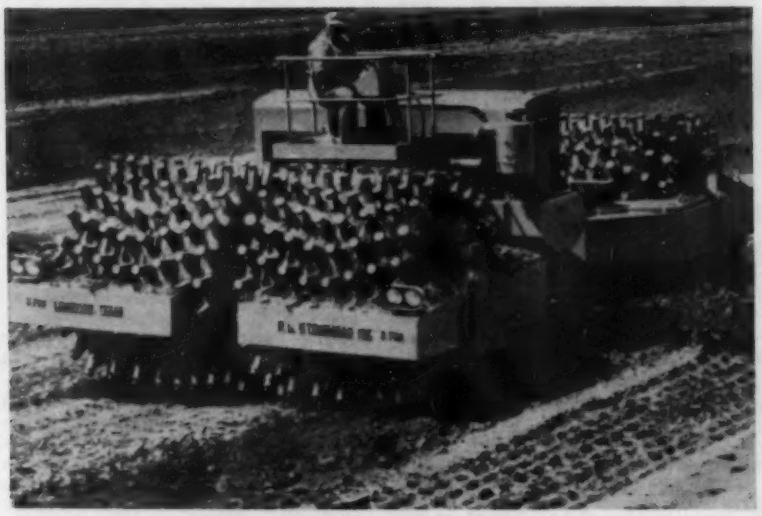
The Division of Highways has taken advantage of this setup. One advantage has been that part of the problem of screening, employing, and releasing temporary employes every year is minimized, as employes in the Student Engineering Trainee classification are carried continually on the roster, with payment being made only for time actually worked. In addition, an assist has been given to engineering students; and the program has helped the long-range recruiting effort for graduate engineers.

8. The contractor associations likewise are playing an important role. For the past few years high-level semi-annual joint meetings have taken place between representatives of the Associated General Contractors and the State Highway Engineer. The purpose: to discuss mutual problems, new developments, and to bring out in the open, discuss and reduce those areas of conflict between Contractors and Engineers. When it is seen that correction to a certain problem, improvement of an existing procedure, or a beneficial change or addition is possible, committees are formed to study details and make recommendations.

Continued on page 175

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*



Le Tourneau "Power Packer" M-50-55

Push-Button-Earth Packer

Maximum compaction at low cost is claimed for a new "push-button" sheepsfoot roller introduced by R. G. Letourneau, Inc.

An operator sits atop the M-50-55 "Power Packer" and fingers a simple panel of electrical controls, driving self-propelled rollers backward and forward at 300 ft. per minute under average working conditions. Major economy is achieved because the diesel-electric rollers travel either direction with identical speed and power. Any number of trips can thus be made over the same ground without turning the machine around. The new unit is 28 ft. long, 14 ft. wide, 12 ft. tall, and weighs 40-tons. Four independently oscillating drums, each 5 ft. long and 5 ft. in diameter, are driven by dc motors geared to inner rims, with travel speed ranging to 5 mph. Generators are coupled to a 420-hp GM diesel. The drums have a total of 480 tamping feet, each 9 in. long, with flat circular heads giving 10 sq. in. surface.

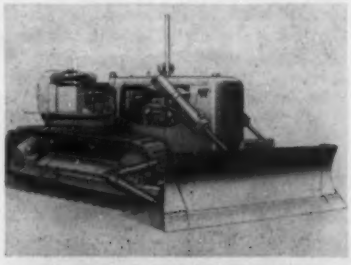
R. G. LeTourneau Inc., 2399 S. MacArthur, Longview, Texas.

For more details circle 101 on Enclosed Return Postal Card.

Improved Tractor

A new D6 Series B tractor with major improvements has been announced by Caterpillar Tractor Company.

Among the major new features are: a compact engine that delivers 93 flywheel hp at 1,600 rpm; two new hydraulic control units, integrally mounted; a tilt cylinder for special applications; an optional transmission for jobs calling for higher



Improved Cat D6 Tractor

drawbar pounds pull and an improved operator's compartment. Hydraulic control pump and tank are located at the rear of the engine, under the hood. This arrangement clears the radiator face and permits greater air flow, which in turn increases radiator cooling ability.

Caterpillar Tractor Company, Peoria, Ill.

For more details circle 102 on Enclosed Return Postal Card.

Heavy Duty Loader

A new, heavy duty type loader for International tractors, designed to operate using the tractor's own hydraulic system is announced by Freeman Loader Corporation.

The down-pressure lift cylinders have hard chrome plated shafts, and all packings are interchangeable. The main frame is of tubular construction, made in two pieces for easy installation

Freeman Loader for International Tractor

and removal. The loader arms are 1 in. x 4 in. high carbon steel, and accommodate a choice of three different buckets: 40 in. combination with plate; 40 in. material, and 66 in. material bucket. Designated Model 725-A, the new loader fits International 300-330-340-350-460 tractors. It lifts over 1500 lb. 10 ft. to bottom of the bucket.

Freeman Loader Corp., Blair Pike Rd., Peru, Ind.

For more details circle 103 on Enclosed Return Postal Card.

Self-Lubricating Roller

A 1,000-hour lube interval International Dura-Roller is standard equipment on three of the five International diesel crawlers introduced recently by Harvester's Construction Equipment Division.

These units are the TD-25, TD-20 and TD-15. On two smaller crawlers, the TD-9 and TD-6, the same shell-and-shaft design provides 500-hour lubrication intervals for the roller. In the roller, the cavities within the shell and shaft act as reservoirs from which a supply of lubricant is fed through drilled passages to bushing and seal surfaces. The full-flow relief passage permits filling the roller with the required amount of lubricant, without danger of over-pressurizing the sealing

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.

New Products

surfaces, the manufacturer states. Excess lubricant and air escape by flowing out and around the nozzle tube to the outside, indicating that the roller is filled. Self-contained oil seals are recessed within the Dura-Roller ends and bolted firmly to the shell. This feature is said to ensure complete protection against dirt and damage.

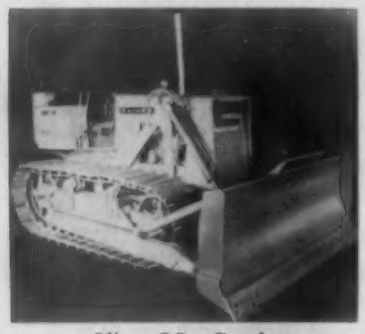
International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 104 on Enclosed Return Postal Card.

Crawler-Tractor

The Oliver OC-9 crawler tractor, offers many "firsts" in its field, states the manufacturer, The Oliver Corporation.

It is said to be the only crawler in its size range to offer a transmission providing independent power to each track, controlling both speed and direction. Operating ease is gained due to the transmission with full power-assisted operation, allowing the operator to spot-turn on one track, execute a counter-rotation turn, make gradual turns within any radius, the maker



Oliver OC-9 Crawler

states. Powered by a 4-cylinder, valve in-head diesel engine, the unit is rated to deliver 62 gross engine hp, 57 net flywheel hp. The bare tractor weighs 9675 lb. Maximum drawbar pull is 16,900 lb. The crawler's length of track on ground is almost 6 ft., which affords 1714 sq. in. of ground contact area. As a result, the ground pressure is only 5.6 lb. per sq. in.

The OC-9 is also available in a factory-built, 1-yd. loader model, the OC-96.

The Oliver Corporation, 400 W. Madison St., Chicago 6, Ill.

For more details circle 105 on Enclosed Return Postal Card.

Hydraulic Derrick

Rectangular side legs and an extra-long middle leg hydraulic cylinder are two of the outstanding features of the new Series 3750 hydraulic derrick manufactured by Holan Corporation.

Holan Model 3750 Derrick

A longer middle leg hydraulic cylinder allows the derrick head to come closer to the ground for forcing the digger deeper into the soil. The integral middle leg with live boom action provides extra power for lifting as much as 5,000 lb., and forcing diggers into hard-frozen, rocky soil. Company specification data rates the unit as a 12,000 lb. capacity derrick, capable of setting poles 75 feet in length. It has been tested, the manufacturer reports, at 22,000 lb. The derrick can be raised in 35 seconds, and stowed in 40 seconds.

Holan Corporation, 4100 West 150th St., Cleveland 35, Ohio

For more details circle 106 on Enclosed Return Postal Card.

Two-Way Radio

An entirely personal two-way radio communications system from the Seiscor Division of Seismograph Service Corp. features light weight and complete portability.

It is a limited range system for person-to-person communications, utilizing

Lightweight Seiscor 2-Way Radio

a completely transistorized transmitter-receiver weighing less than 1 lb., including batteries. The units are available in 5 standard models, each having its own individual features. General features of all units are industrial-type printed circuit with crystal controlled transmitter and super-heterodyne receiver, providing 750 milliwatts of usable radio power. The units are available for use in 27 megacycle or 42 megacycle operations; the 27 megacycle units do not require any type of license.

Seiscor Division of Seismograph Service Corp., Box 1590, Tulsa, Okla.

For more details circle 107 on Enclosed Return Postal Card.

Space Heater Line

A completely new line of portable oil fired space heaters has been introduced by Emglo Products Corporation. Included in this line of Porto-Heat units are two sizes producing 120,000 and 240,000 Btu's per hour respectively. Each size is available in three models—manual, semi-automatic and automatic control.

Based on an exclusive double-pass combustion system. The units burn kerosene, No. 1 or No. 2 fuel oil under high pressure. A high velocity fan propels the heat, directing it to the area of greatest need which may be 30 or 40 feet away. Combustion control permits adjustment for different fuels and

Emglo "Porto-Heat" Unit

changing conditions. Model 120 boasts an extra-large 15 gallon fuel tank which provides over 17 hours of continuous operation: fuel consumption is .85 gph. The 120 is completely self-contained and mounted on large rubber tires for easy portability. Model No. 240 features a 15 gallon fuel tank. It consumes 1.75 gallons per hour allowing continuous operation for 8 hours without refilling. It has a two wheel handle mounting for easy moving, and operates on regular 115 volt 60 cycle circuits.

Emglo Products Corporation, Johnstown, Pa.

For more details circle 108 on Enclosed Return Postal Card.

Electronic Batching Controls

Electronic Batch Controls which can be used either as new plant equipment or as conversion units to modernize any make batch equipment, are now available from C. S. Johnson Company, a division of Koehring Company.

The controls are said to give accurate, automatic remote control of batching operations. Simplified control permits dial selection of one of a number of pre-set formulas, and selec-

Johnson Batch Conrol Panel

tion of batch quantities. Signal lights keep operator informed at all times of the progress of the batching. Interlocks prevent improper batching or discharging, the manufacturer states. Equipment can be installed so that discharge of completed batch can be controlled either by the operator at the central control console or by the truck driver at the batcher discharge gates.

C. S. Johnson Company, P. O. Box 71, Champaign, Ill.

For more details circle 109 on Enclosed Return Postal Card.

Cutting Tool for Granite

A new construction process for cutting granite has been developed by the Linde Company, Division of Union Carbide Corporation. With this process, the manufacturer states that it is possible to carve and shape stone up to 5 times faster than mechanical methods.

Shown in the accompanying photo, are small jet flames, similar to those in jet afterburners, emitting from the Oxweld FSJ-6 which was used to carve large sections of granite off the Queensborough Bridge in New York City. Oxygen and kerosene are combined to produce the intensely hot flame; the mixture burns in an internal water-cooled rocket chamber in the front end of the unit. The resulting flame is emitted from a convergent-divergent type of nozzle at a velocity of 7,000 ft. per sec. Size of the stone-shaping flame is controlled by a fuel control valve on the front end of the torch.

Oxweld FSJ-6 Cutting Granite

Linde Company, Division of Union Carbide Corporation, 30 E. 42nd St., New York 17, N. Y.

For more details circle 110 on Enclosed Return Postal Card.

Air Compressor

A new portable air compressor announced by SpeedWay Division of Thor Power Tool Company, easily can be rolled to the job to provide up to 150 lb. per sq. in. of air pressure for powering of air tools and attachments; operation of paint sprayers; cleaning of equipment and for other job site applications requiring air power.

The new Thor "SpeedCompressor" is equipped with 12-gal. safety-tested

Speedway Air Compressor

air tank, automatic air control switch, and automatic relief valve to assure safe operation of the equipment. The compressor has a 20-ft. air hose with air chuck, and is powered by a ½-hp. shock-resistant motor. 8 in. rubber tires and a sturdy tubular handle give the 91-pound unit portability to job sites.

Speedway Division, Thor Power Tool Co., 1421 Barnsdale Rd., LaGrange Park, Ill.

For more details circle 111 on Enclosed Return Postal Card.

Rotary Compressor

LeRoi Division of Westinghouse Air Brake Company reports improvements and additions to its Model 125RG2 portable rotary compressor.

Now on the 125 cfm two-stage unit are three new safety features. The features included are a cut-off switch that automatically shuts down the compressor if engine oil pressure drops too low; an automatic dump valve that instantly releases air pressure in receiver when compressor is shut down, this is said to eliminate the possibility of oil backing up into the air-end; also, there is a non-wearing orifice located in the receiver outlet, assuring proper air-end oil cooling by holding 40 lb.

LeRoi Compressor with Safety Features

pressure in the receiver, the maker states. Other safety equipment includes a high temperature cut-off switch, a flexible mounted bumper, rain cap on the muffler and a hinged metal cover for the battery. A spring-loaded locking pin for the caster shell and handles on both sides of the towbar facilitate on-the-job moving and hook-up for towing.

Sales Promotion Dept., LeRoi Division, Westinghouse Air Brake Company, Milwaukee 1, Wisconsin.

For more details circle 112 on Enclosed Return Postal Card.

Reversible Spreader

Designed for sealcoating, ice control and road widening projects, the Model Y2 reversible spreader from Highway Equipment Company features a complete unit including body engine and spinner which can be reversed in 15 minutes.

Mounted forward on the left side for ice control, the models 18-in. diam. spinner is said to spread evenly in widths of 5 to 40 ft. with complete

Y-2 Reversible Spreader

visual control. Material is spread ahead of the rear wheels for extra traction without loss onto road shoulders. For sealcoating, the body is reversed, placing the spinner at the right rear. In this way, the spreader can unload aggregate in road-widening operation or windrow to the right side of the cab.

Highway Equipment Company, Dept. H44-6, 616 Ave. N.W., Cedar Rapids, Iowa.

For more details circle 113 on Enclosed Return Postal Card.

Nylon Tire

A new nylon tire designed by B. F.

New Products

Goodrich for farmwagons and implements has industrial applications which include use on air compressors, lowboy transport trailers and jack drills.

The tire combines passenger tire tread for good wear on hard surfaces with extra tread width that gives high flotation on soft surfaces, the maker states. The tire is available in 7.60-15 6-ply rating and has a carrying capacity of 1,765 lb. at 20 mph. It is recommended for wagons, trailers, front tractor wheels and to support such heavy mounted tools as front end loaders and others.

B. F. Goodrich Tire Company, B. F. Goodrich Company, Akron, Ohio.

For more details circle 114 on Enclosed Return Postal Card.

Straddle Truck Carrier

A new, medium-capacity "Straddle Truck" carrier has been introduced by Hyster Company, offering maneuverability for loads up to 20,000 lb.

Designated the M200E, the carrier is a companion machine to the 30,000 lb. Hyster M300E. The 20,000-pound truck carrier shares many components with the heavier model, including power plant, drive train and hoist system.

Hyster Truck Carrier

Dual-coil spring, independent suspension system with hydraulic shock absorbers on each wheel give a smooth ride plus stability for off-the-road load spotting, the maker states. Power brakes are also standard. Power from a 164-horsepower V-8 engine is transmitted through a heavy-duty drive train constructed of oversize parts to insure long life under the most rugged of conditions. A four-speed, full-reversing, synchromesh transmission is fitted.

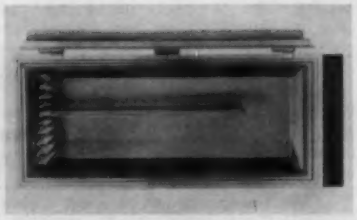
Hyster Company, P. O. Box 847, Danville, Ill.

For more details circle 115 on Enclosed Return Postal Card.

Blue Print Safe

A new, vertical blue print safe holds up to 1,000 plans in a fire-and-theft resistant compartment.

Prints are retained on 30 in. long, removable steel "Glider" plan holders for quick vertical filing. Evenly spaced



Vertical Blue Print Safe

thumbnuts on plan holders "tension-hold" 100 prints, to 30 in. wide and 48 in. in length. Filed T-topped plan holders are retained from end-to-end in all-steel channels, with no chance of bending or springing, the manufacturer states. Weighing approximately 1,000 lb., the safe is 58¼ in. high, 23¼ in. wide and 36½ in. deep. Inside cabinet dimensions are 19⅜ in. wide, 53 in. high and 30 in. deep.

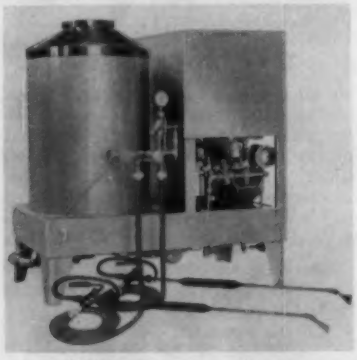
Momar Industries, 4176 W. Montrose Ave., Chicago 41, Ill.

For more details circle 116 on Enclosed Return Postal Card.

Steam Cleaner

Malsbary Manufacturing Co. has announced the Model 330, a new fully automatic, gas-fired steam cleaner for truck and heavy equipment cleaning where a large flow of solution is required on an almost continuous stop-and-go basis.

The unit delivers 330 gallons of hot solution hourly at 60-90 psi. It is a stationary unit, but nozzle-controlled



Malsbury Steam Cleaner

guns (choice of one or two) enable user to clean effectively 100 to 200 feet from the cleaner. Operator controls flow of solution at the gun nozzle by squeezing or releasing his grip on the gun handle. Where two guns are used, either gun is controlled independently of the other. Two-gun operation permits doubling up, thus reduces equipment downtime during busy periods.

Malsbary Mfg. Co., 845 - 92nd Ave., Oakland 3, Calif.

For more details circle 117 on Enclosed Return Postal Card.

Tractor, Tractor Shovels

Three new multi-purpose Massey-

M-F 1001 Tractor Shovel

Ferguson industrial rigs feature the company's exclusive "Instant Reverse" with torque converter. They are the Models 1001 and 406 Tractor Shovels, and the 204 Industrial Tractor.

Featuring full-time power steering and a wide variety of attachments, all three of these new units provide real utility in digging, trenching, grading, loading, stockpiling and other construction assignments the maker states. The instant reverse feature is accomplished through multiple disc hydraulically activated reversing clutches controlled by foot pedals. This pedal shift arrangement leaves the operator's hands free to steer and to manipulate the loader or attachments. Attachments for the 1001 and 406 include angle dozer, lift fork, swinging crane, scarifier, backhoe, rotary broom, Ram pick-up sweeper, Ram rotary snow blower and leaf loader. The 1001 also has the Ram blacktop spreader attachment.

Massey-Ferguson Industrial Division, Block 1000 South West St., Wichita, Kansas.

For more details circle 118 on Enclosed Return Postal Card.

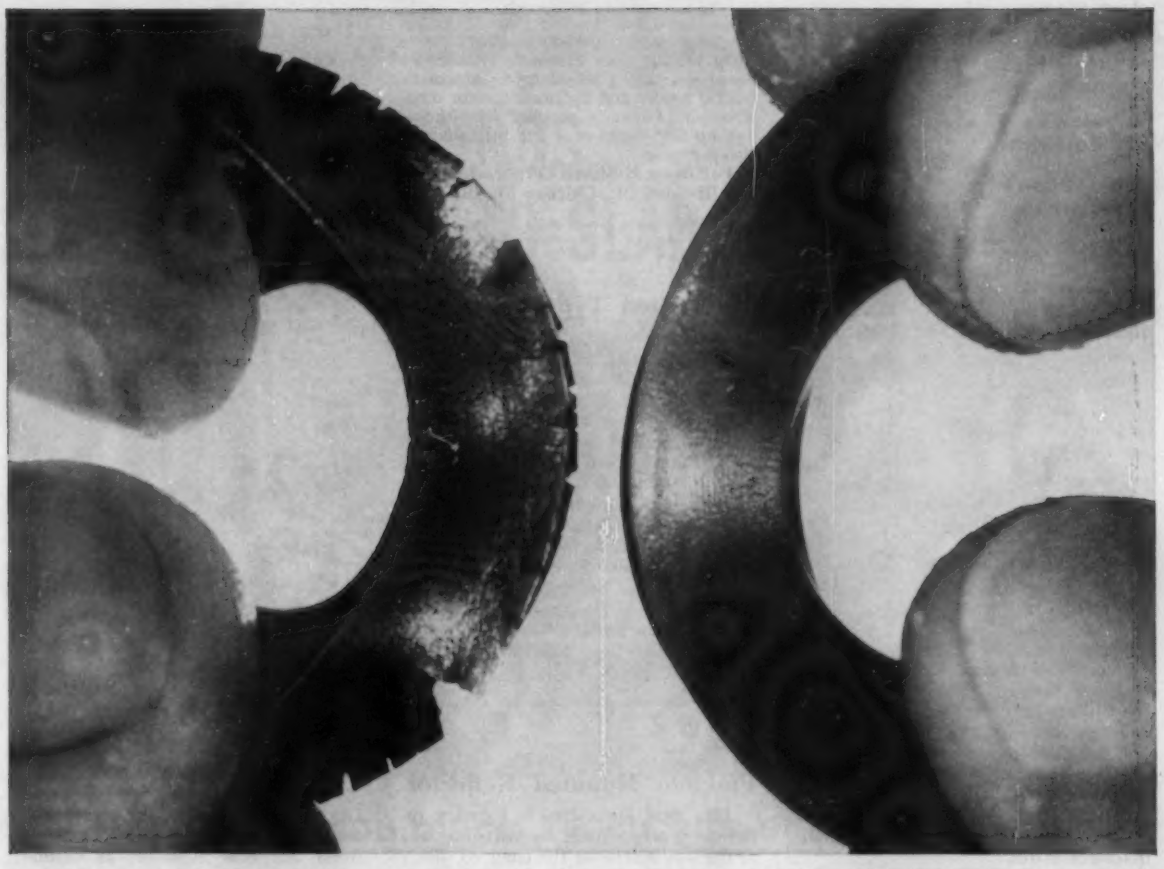
Hydraulic Track Adjuster

A hydraulic track adjuster, replacing a screw type, has been developed by International Harvester Company's Construction Equipment Division for all future International TD-20 crawler tractors.

Track tension is increased by using a regular hand grease gun to force grease into a lubricating fitting on the track adjuster. The amount of grease pumped regulates the degree of tension. To ease tension, a relief screw is backed off to allow grease to escape. The tension relief screw has the following safety features: When the screw is backed off, a check ball behind it comes away from its seat, permitting excess grease to be directed through a drilled passage running inside the track guide. Also, slotting arrangement of the screw is said to eliminate any danger of pressure buildup from behind, as the screw is being backed off.

Consumer Relations Department, International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 119 on Enclosed Return Postal Card.



Two torque converter seals, subjected to 300 hours of service at 325° F., show added protection of D-A Torque Fluid. Seal on left, used with ordinary torque fluid, is brittle and cracked, has shrunk excessively. Seal on right, used with D-A Torque Fluid, remains resilient and reveals no cracks or deterioration. It was protected by D-A's *exclusive* preservative.

Prevent seal trouble, increase converter efficiency with D-A TORQUE FLUID

Better performance, less maintenance and longer equipment life . . . these are among the benefits you get when you specify D-A Torque Fluid for (1) heavy-duty automatic transmissions, (2) hydraulic systems and (3) rotary compressors.

Note these advantages: D-A Torque Fluid possesses superior oxidation stability, provides increased efficiency through carefully controlled viscosities and allows operation in even the coldest weather because of minus 35° F. pour point.

But that isn't all! D-A Torque Fluid is ideal for all types of rotary compressors because special high-temperature oxidation inhibitors prevent formation of sludge and varnish, extend compressor life and permit longer operation periods between lubrication changes.

And D-A Torque Fluid gives a big bonus in the protection of rubber seals . . . extends the life of seals, prevents leakage. This added protection is accomplished by a special seal preservative found only in D-A Torque Fluid. Seals last indefinitely . . . shrinkage and cracking are eliminated . . . swelling is controlled to an ideal maximum of 0.2%.

Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.

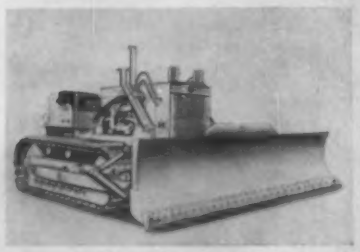
. . . for more details circle 294 on enclosed return postal card

New Products

Four TD-25 Blades

Four specially-designed blades for use with the new International TD-25 diesel crawler tractor have been produced by International Harvester Company's Construction Equipment Division.

The direct-lift hydraulic bulldozer blade and the direct-lift cable bulldozer blade, have a heavy-duty, box-framed, moldboard construction. Tilt is adjustable to 18 in. between blade ends,



I. H. Bullgrader Blade

and there is a maximum pitch adjustment of 10 degrees. The direct-lift hydraulic Bullgrader and direct-lift cable Bullgrader blades also have cutting edges of heat-treated, high-carbon steel, and the same construction as the dozer blades. Bullgrader blades can be angled from straight to 25 degrees right or left, and tilt is quickly adjustable to 12 in. between blade ends, the manufacturer states.

Consumer Relations Department, International Harvester Co., 180 N. Michigan Ave., Chicago 1, Illinois

For more details circle 120 on Enclosed Return Postal Card.

11,000 Lb. Tractor

A new 11,000 lb. capacity rubber-tired tractor shovel has been introduced by Pettibone Mulliken Corporation.

Designated the Model PM-440, it is the largest unit in the firm's new line of "Speedall" Tractor Shovels. The tractor has a lifting capacity of 21,000 lb. and a breakout force of 24,800 lb. Depending upon the weight of the material being handled, buckets are furnished in S.A.E. heaped capacities of 3.00, 3.25, 3.90 and 4.25 cu. yd. Bucket rollback at ground level is 40 deg. Clearance under bucket hinge pin is 11 ft. 10 in. Reach from the front tires to the bucket lip is 3 ft. at the maximum dumping height of 9 ft.; at 7 ft. dumping height the reach is 4 ft. 5 in. Standard equipment also includes the manufacturer's Speedmatic power shift transmission and planetary axles; Allison torque converter; 4 wheel hydraulic power assist brakes; dual hydraulic cylinder assisted steering; 4 wheel drive; automatic bucket leveler and hydraulic system shock absorber. Power is supplied by either a 152 hp GM diesel or a 175 hp Cummins diesel engine.

PM-440 Tractor

Pettibone Mulliken Corporation, 4700 W. Division St., Chicago 51, Ill.

For more details circle 121 on Enclosed Return Postal Card.

Specialized Typing Unit

An interchangeable type bar to facilitate scientific and specialized business typing has now been included on the Remington Electric typewriter.

The new type bar enables a typist to quickly snap in special symbols which may be needed for typing work in any one of 18 fields of science and business. Hundreds of symbols are available, including degree signs, numerical subscripts, the millimeter symbol and the Greek alphabet. Specially designed symbols can be ordered, including many company trademarks.

Remington Rand, Division of Sperry Rand Corporation, 315 Park Ave. S., New York 10, N. Y.

For more details circle 122 on Enclosed Return Postal Card.

Flexible Mounted Reflector

This new Dietz No. 85-F reflex reflector protects itself by swinging out of the way whenever the truck to which it is fastened backs against a loading dock.

Extra heavy mounting strap, (3-in.) in width, prevents reflector from swinging while driving, but is flexible

Dietz 85-F Reflector

enough to prevent damage when reflector is struck, the manufacturer states. The 3-in. acrylic lens is deeply recessed in a heavy, solid steel housing for further protection. Both reflector housing and mounting bracket are finished in metallic gray.

R. E. Dietz Company, 225 Wilkinson St., Syracuse 1, N. Y.

For more details circle 123 on Enclosed Return Postal Card.

Thread Striking Bars

Rope thread, alloy steel and heavy duty design in Brunner & Lay striking bars ensures greater rigidity for deeper rock drilling, the maker reports. Avail-

Brunner & Lay Striking Bars

able in all popular shanks and thread sizes, with rope or standard threads, with or without ring seals.

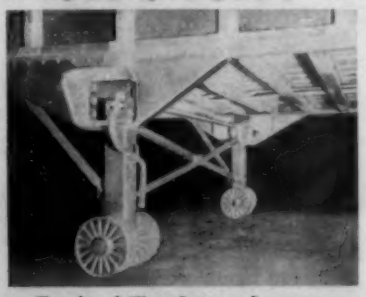
Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.

For more details circle 124 on Enclosed Return Postal Card.

Extendible Supports

Fruehauf's new Two-Speed Square Leg Supports designed for positive protection against leg rotation and side stress, are now available as standard trailer equipment from the Fruehauf Trailer Company.

The company reports that these supports are easier to operate in both high and low gear, because the crankshafts and gearshifts are mounted on bronze bushings. The operating screws in both

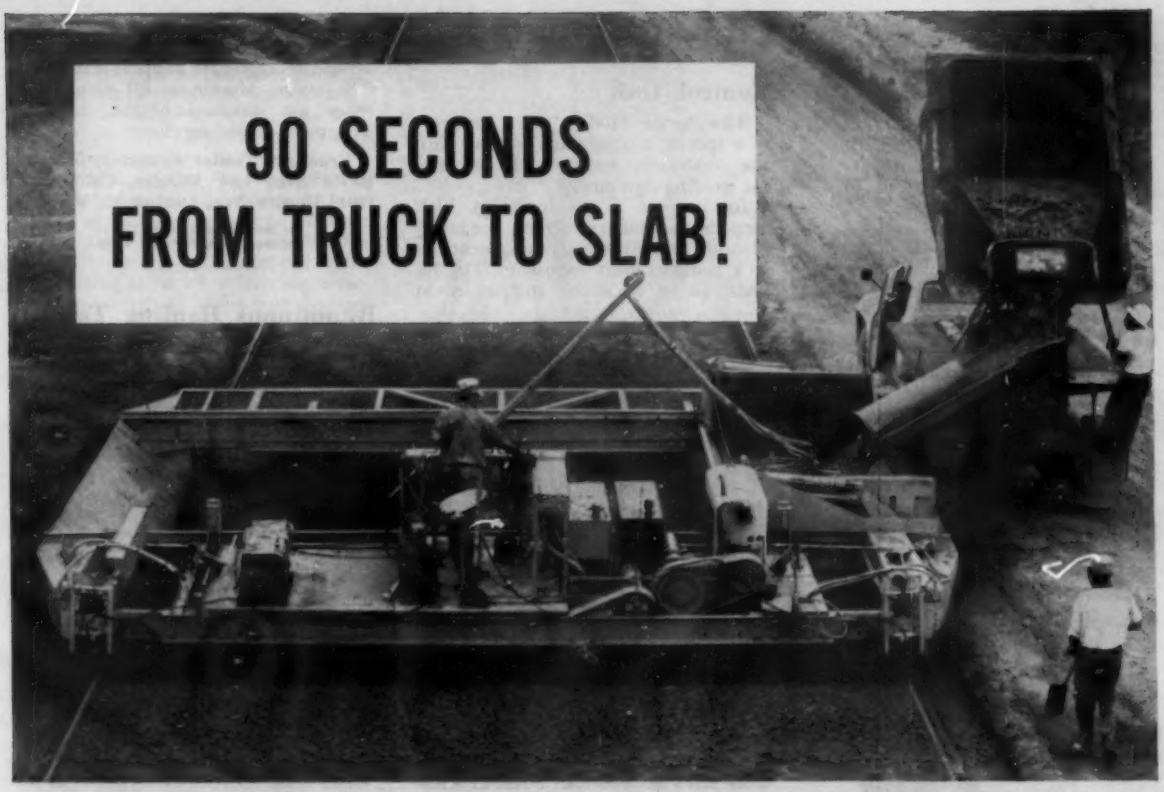


Fruehauf Two-Square Supports

legs are also carried on bronze bushings and tapered roller thrust bearings. The units are said to be stronger through the use of a 4½ in. square outer leg tube which has the size and strength of a 5⅝ in. round tube. When the supports are lifted and lowered, they cannot spin on one another, because their shape is positive protection against leg rotation, the manufacturer states.

Fruehauf Trailer Company, Detroit 32, Mich.

For more details circle 125 on Enclosed Return Postal Card.



That's how fast you place 5½ cu. yds. of concrete with the

MAXON DUMPCRETE SPREADER

60 seconds to chute-load the spreader bucket with the fast, flexible Dumpcrete hauling body—15 seconds to spread—15 seconds to move and strike off. Only 90 seconds completes the cycle. Placing rate ranges from 180 to 260 cu. yds. per hour, depending on plant capacity.

Dumpcrete Spreaders place to desired depth; base course, top course or full depth. Widths are adjustable from 11 to 25 feet. Controls are *hydraulic*. Design is simple and trouble-free. Construction is rugged. Applications include highways, airport runways, streets. And Dumpcrete Spreaders handle concrete of the lowest workable slumps.

Maxon developed this new spreader so that contractors could take full advantage of the time and labor-saving benefits of the "central mixing—non-agitated hauling" method. The Dumpcrete Spreader with Dumpcrete Trucks make a high-production team that's been job-proved by some of the nation's top contractors during the past season.

Get full details now. Find out how the complete Dumpcrete method can help you speed work, cut costs and maintain quality on your next paving job. Send the coupon today for new catalogs—or call your Dumpcrete distributor.

Send for this new ***Dumpcrete Literature***

MAXON
MANUFACTURING DIVISION

MAXON CONSTRUCTION COMPANY, Inc.
Manufacturing Division R-2 • 2600 Far Hills, Dayton 19, Ohio

Please send me the new Dumpcrete Spreader catalog with specifications

NAME_____
TITLE_____
FIRM_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

. . . for more details circle 331 on enclosed return postal card

Avoid One Cause of Air Line Leaks and Pressure Loss

"BOSS"
Self-Honing
AIR VALVES

Female I. P. T.
Both Ends

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTEGRALLY ATTACHED HANDLE—In sizes ⅜" to 1½" valve stem and handle are combined in a strong one-piece forged steel unit which is anchored to the bronze plug within the valve body. This patented feature eliminates stem and handle breakage. Sizes ¼", ⅜", ½" and 2" have externally riveted handles.

Male I. P. T. Both Ends

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO. LTD., TORONTO Associate Companies

. . . for more details circle 296 on enclosed return postal card

New Products

Control Unit

The Arcair Model "A" Contractor is a special control unit for use with the Automatic Arcair torch and also for welding equipment.

Its purpose is to interrupt high amperage secondary currents, for safety of both personnel and equipment. It is a compact unit measuring 8½ in. wide, 10 in. in depth and 20 in. in height. The complete unit ready to be wired into a circuit weighs only a little more than 40 pounds. Built to withstand rough use, it is equipped with heavy silver alloy contacts. Though rated at 600 amps, this contactor has performed satisfactorily under much higher loads, the manufacturer states.

Arcair Model "A" Contactor

Arcair Company, P. O. Box 431, Lancaster, Ohio

For more details circle 126 on Enclosed Return Postal Card.

Cement Hopper

A new type of cement hopper has been put on the market by The Fruehauf Trailer Company. Completely Freuhauf-built, the hoppers are lighter than previous models, and have full 26 in. butterfly gate at bottom for quick unloading. The new hoppers encompass many design improvements and emphasize weight reduction along with large capacity. The standard units have 510 cu. ft. capacity each, but can be obtained in larger capacities as needed.

Among the weight reducing features are the all-aluminum fill dome and interliners, the latter removable for conversion to aggregate hoppers if desired. The 20 in. aluminum fill dome and cover are standard height, dovetail with most unloading chutes.

Fruehauf Cement Hopper

Fruehauf Trailer Company, 5137 S. Boyle Ave., Los Angeles, Calif. and 10942 Harper Ave., Detroit 32, Mich.

For more details circle 127 on Enclosed Return Postal Card.

Bituminous Hauling Tanks

Four different shapes and styles of bituminous hauling tanks are offered by E. D. Etnyre and Company. All of the firm's tanks are specifically designed and constructed to customer's specifications for the transportation of hot bituminous materials, heavy fuel oils, wax, and chemicals.

The "TR" model is a tapered-shape tank which provides fast, positive drainage at the rear. The round cross-section offers the peak strength in the tank shell. A doubled-tapered design is also available, model "D-TR". Tapered toward the center, this tank provides center drainage and the conical shape gives added tank strength. Model "LW-R" is a cylindrical tank which offers the greatest capacity per pound of tank shell with circular cross-section maintaining tank strength. The straight oval hauling tank is said to have the lowest possible center of gravity and the maximum payload.

Etnyre Double-Tapered Tank

E. D. Etnyre and Company, Oregon, Ill.

For more details circle 128 on Enclosed Return Postal Card.

180 Amp Welder

Designed with the "occasional" weldor in mind, the dial-type control of the new Lincoln 180 amp arc welder provides easy positive setting of the welder output over a wide amperage range.

Electrodes up to 3/16 in. size can be used to weld materials from 20 guage to ½ in. or thicker plate. The new design is said to have unusually stable arc characteristics and will weld mild steel, low alloy steel, and 18-8 type stainless steel. Operation on 220 volt single phase power supply combined with compact, light-weight construction permits easy movement of the welder to the job when necessary.

The Lincoln Electric Company, Cleveland 17, Ohio.

For more details circle 129 on Enclosed Return Postal Card.

Caulking, Sealing Compound

A two-component family of caulking and sealing compounds for construction applications has been introduced by the Presstite Division, American-Marietta Company.

Identified as the No. 1190 Series, suggested uses for the sealers include serving as an adhesive to bond between new and old concrete; as a grout between concrete joints to seal out water and deicing salts; for cementing directional markers and traffic lane dividers to asphaltic or concrete road surfaces; as a prime coating for asphalt overlay on concrete highways; as a protective coating for steel, concrete and wood; and as a bonding agent to bond sand, grit and other anti-slip abrasives to streets and highways.

Presstite Division, American-Marietta Company, 39th and Chanteau Avenues, St. Louis 10, Mo.

For more details circle 130 on Enclosed Return Postal Card.

Pavement Breaker

A heavyweight paving breaker, Blue Brute WB-82, has been introduced by Worthington Corporation.

Weight, balance and smoothness add to operating convenience, the manufacturer states. The progressive throttle valve simplifies starting moils under adverse conditions, and the bushed

Worthington Blue Brute

front head and throttle valve combined with blu-coated parts are said to assure prolonged, efficient operation at minium maintenance costs. The unit is available with spike drive front heads for spikes to 1¾ in. heads which are readily interchangeable with the standard paving breaker housing.

Worthington Corporation, Holyoke, Mass.

For more details circle 131 on Enclosed Return Postal Card.

Free Calculator

The Forney PSI Calculator for concrete products has been completely revised, and is available on request, free. Now included is instant conversion data from total load to psi on 17 standard test specimens and masonry units ranging from 2 in. x 2 in. cubes and 3 in. x 6 in. cylinders to 12 in. x 16 in. and 12 in. x 18 in. masonry units. Pocket size and easy to use, it will be sent to individuals providing names, title, and business affiliation.

Forney's Incorporated, Tester Division, P. O. Box 310, New Castle, Pa.

For more details circle 132 on Enclosed Return Postal Card.

Clay Sewer Pipes

Clay sewer pipe with "Vitri-Seal" joints, a compression type seal that is said to be self-aligning, leak-proof, and resistive to acids and alkalis is available from Natco Corporation.

The joint conforms to all requirements of ASTM Specification C13–for standard strength clay pipe or to Specification C200–for extra strength; and to Type III of Specification C425-58T, for pipe joints having resilient properties.

Natco Corporation, 327 Fifth Ave., Pittsburgh 32, Pa.

For more details circle 133 on Enclosed Return Postal Card.

TIME TESTED...

QUALITY • DURABILITY • ECONOMY!

The hourglass has measured a quarter of a century while the field has been the test tube for Williams equipment.

Quality of materials and workmanship means durability under all conditions; the result can only be economy to the driller, economy to the general contractor, economy to the builder.

The manufacturers of Williams earth boring machinery have pioneered the development of auger-type drilling equipment for the installation of drilled piles and drilled and belled caissons. Whatever your large diameter drilling problem the engineers at the Hugh B. Williams Mfg. Co. will apply years of experience plus enthusiasm for progress in arriving at a satisfactory solution.

HUGH WILLIAMS

HUGH B. WILLIAMS MFG. CO.
8330 Lovett Ave. • Dallas, Texas
Manufacturer

JOSLYN MFG. & SUPPLY CO.
2101 Corinth St. • Dallas, Texas
Distributor

WRITE FOR ILLUSTRATED DESCRIPTIVE LITERATURE

. . . for more details circle 351 on enclosed return postal card

New Products

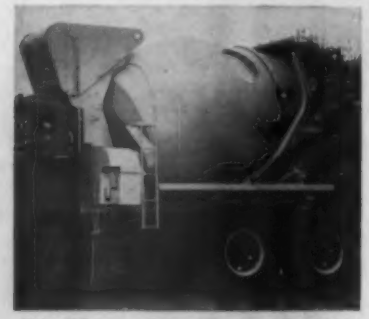
Concrete Mixers

"Swept back styling with a purpose" for concrete mixers is announced for Worthington Corporation's new line of Fleetmaster and Fleetbuilder Truck Mixers.

The modern lines of the restyling are said to lend themselves to the practical operation of a truck mounted mixer. The center of gravity has been moved forward as much as 16 in. in all models, thereby permitting the user to haul more concrete legally. The improved center of gravity characteristics stem from several factors. The water tank has a swept back triangular design. Its slope follows that of the mixing drum and makes possible the moving forward of the drum. Weight savings are provided by pipe construction in the rear support frame and a truck-type transmission with 4 speeds forward and 4 in reverse.

Worthington Corporation, Harrison, N. J.

For more details circle 134 on Enclosed Return Postal Card.



Worthington Power Take Off Model

Tractor-Shovel

Addition of the Model 150, a 1-⅝ cu. yd. capacity tractor shovel, is announced by the N. P. Nelson Iron Works.

Some of the features of this unit are its underslung arms which are said to give 100 percent operator visibility and safety; 40 deg. tipback bucket at ground level and maximum dumping height, under bucket edge, of 9 ft. Forward reach at 7 ft. dumping height is 5 ft. 2 in. The tractor-shovel is powered by a Hercules G-298H, 107 hp gas engine or Hercules D-298H diesel. Allison Torqmatic full reversing transmission gives 3 speeds forward and reverse ranging from 3.3 to 27 mph.

N. P. Nelson Iron Works, Inc., 850 Bloomfield Ave., Clifton, N. J.

For more details circle 135 on Enclosed Return Postal Card.

Nelson "150" Tractor-Shovel

Belt Loader

A high capacity belt loader designed to fill large trucks and scrapers has been announced by Jelco., Inc.

Having a 30-ft. conveyor that reaches 15½ ft. high at discharge end, "Jeb-Loader" can cast up to 1750 yd. per hr. and load up to 800 yd. per hr. manufacturer states. A 32-in. diameter cutting disc feeds material to a trough-

Jebco, Tall Belt Loader

THE NEW HANCOCK ELEVATING SCRAPER
(Shown on John Deere 840 Tractor)
FORCED EJECTION • LARGER TIRES • NEW DRIVE
HEAVIER • MORE CAPACITY

Take advantage of these new features that are time and money savers for you! Forced ejection saves you operating time and manpower by providing a positive — controlled dump. Larger tires make the heavier, improved scraper more maneuverable. New, improved drive means heavier loads with less horsepower than ever before . . . 7½ yard and larger capacities. The new Hancock Scraper can be pulled with either the 830 or 730 John Deere, or similar industrial tractor, with front wheel dolly; or by direct connection to tractor. For "Engineered" help with your earth moving problems, contact Hancock today!

HANCOCK MANUFACTURING COMPANY
PO 3-8297 P. O. BOX 1359 LUBBOCK, TEXAS

. . . for more details circle 316 on enclosed return postal card

shaped belt, which travels at 614 fpm. The belt is kept free of clinging dirt by scrapers bolted to the conveyor frame. A stabilizing tandem having rubber-tired wheels that oscillate with the ground contour carries most of the conveyor weight. This is reported to mean that the balance of the motor grader is not disrupted, thereby utilizing all of the traction that the motor grader is capable of delivering. The unit is designed to team with the larger motor grader of the LeTourneau-Westinghouse and Caterpillar lines.

Jebco, Inc., Blair, Nebraska.

For more details circle 136 on Enclosed Return Postal Card.

Hydraulic Crane Boom

The crane frame of this hydraulic boom from the Towmotor Corporation is constructed of tubular steel, electrically welded for maximum strength.

This crane is said to be most useful for large, unweildy loads that cannot be moved by conventional lift truck forks. Lifting capacity on the hook-

Towmotor Crane Boom

line is 5,000 lb. and line pull is 2,500 lb. The crane boom may be installed on any Gerlinger lift truck up to 22,000 lb. capacity; it can be removed and the truck operated in conventional manner.

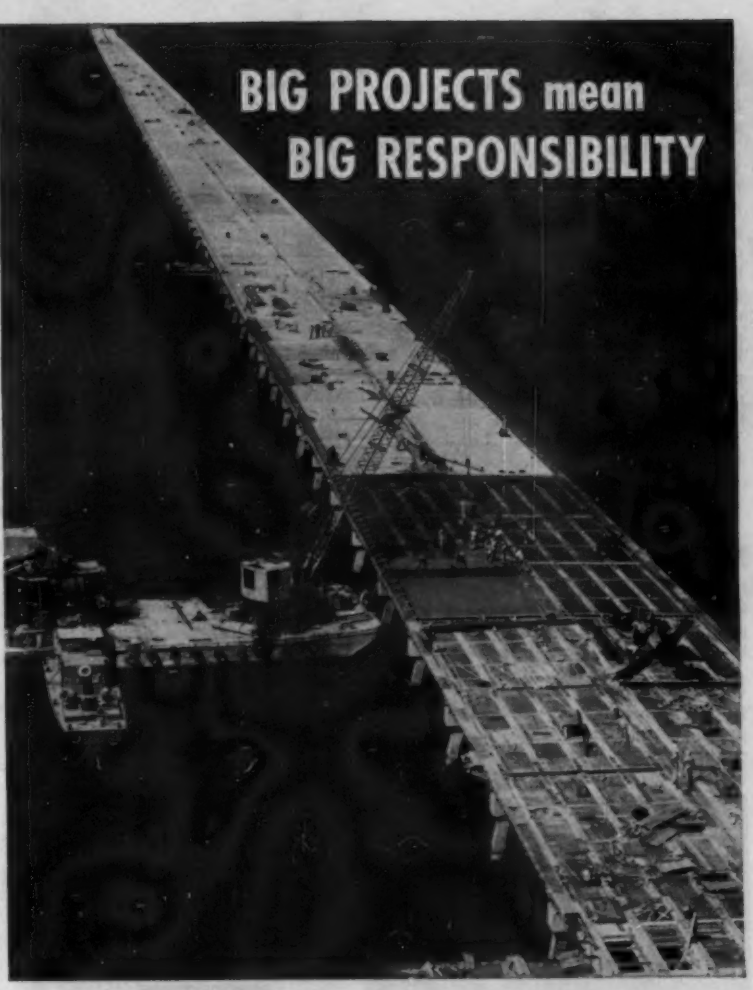
Towmotor Corporation, 1226 E. 152nd St., Cleveland, Ohio.

For more details circle 137 on Enclosed Return Postal Card.

Warning Flasher

New five and seven-inch diameter

Pacific Mercury Flasher



Contractors know the risks involved, the things that may happen when big projects get under way.
They face these risks with confidence when they depend upon THE FIDELITY AND CASUALTY COMPANY OF NEW YORK for . . .
. . . all types of bonds required
. . . carefully-planned insurance to protect their liability and their property investment.
Since 1876 THE FIDELITY AND CASUALTY COMPANY has been an outstanding leader in this field, always in step with progress, always alert to the contractors' needs.

The Fidelity and Casualty Company of New York

"Writing Bonds Since 1876"

a member company of America Fore Loyalty Group

. . . for more details circle 277 on enclosed return postal card

New Products

warning lights with a one-inch wide brilliant circle of light around the rim are now available from Pacific Mercury.

The lights are available in amber and red, and have been designed to offer greater nighttime visibility and traffic safety. Flash rate of the lights is adjustable to meet specific requirements, and maximum "on" time has been extended 25 to 30 percent. Lights are vapor-proof, completely safe for use in the presence of gasoline or explosive vapors, the manufacturer states. Both models are available with tamper-proof switch and "Solarstat" for automatic turn-on as the sun goes down, turn-off when the sun rises.

Pacific Mercury, 13232 Leadwell, North Hollywood, Calif.

For more details circle 138 on Enclosed Return Postal Card.

Miniature Seismograph

Subsurface information without drilling is possible with this miniature engineering seismograph manufactured by Geophysical Specialties Company.

The 16-lb. electronic instrument provides complete information for precisely determining depth to bedrock, the presence or absence of bedrock or other solid materials, and accurate identification of subsurface materials, the

Taking Seismograph Readings

manufacturer states. Operation of the instrument requires two men, and can be handled on foot in any type of terrain. In using the machine, seismic impulses are produced by a sledge hammer. An electronic counter circuit measures the time required for sound waves to travel from the blow of the sledge hammer through the earth to the instrument. Depth and type of material are determined with the instrument readings.

Geophysical Specialties Company, 15409 Robinwood Dr., Hopkins, Minn.

For more details circle 139 on Enclosed Return Postal Card.

Hold-Down Anchor

The Dayton Sure-Grip and Shore Company has announced a new non-rigid hold-down anchor said to simplify assembly and stripping in pre-stressed, pre-cast concrete erection.

The anchor swivels in the direction from which cable tension is exerted, thus easing pull on the bolt which holds the anchor in position. This positive action aids in preventing bent bolts, and makes more flexible control of cables possible during stressing operations, states the producer. In addition to swivel action, the anchor utilizes press-on speed nuts for faster assembly. Also coil threads are non-clogging for faster stripping.

The Dayton Sure-Grip and Shore Company, Miamisburg, Ohio.

For more details circle 140 on Enclosed Return Postal Card.

Aerial Ladder

A new unit, designated the Series HLE Revolving Aerial Ladder, has been added to the line of aerial equipment manufactured by the Powers-American Division of McCabe-Powers Body Company.

Elevation of the ladder is actuated by a hydraulic cylinder, powered by an electric motor-driven pump. The motor, operated by the truck battery, is designed to work with 6 or 12 volt chassis electric system. Control switch

Hydraulically-Operated Ladder

can be furnished to permit operation of the ladder from the working platform. The unit is lowered by gravity. A manually-operated check valve regulates release of oil from the hydraulic cylinder, aiding in positioning of the ladder and controlling speed of descent. A handwheel, which operates a worm and ring gear mechanism, rotates the ladder 360 degrees in either direction. The new ladder will be offered in four sizes; the ground-to-working platform heights of the four sizes available are 27 ft., 31 ft., 35 ft., and 40 ft.

McCabe-Powers Body Company, 5900 North Broadway, St. Louis 15, Missouri

For more details circle 141 on Enclosed Return Postal Card.

Utility Houses

Two all-steel utility buildings have been designed by Martin Steel Corporation as portable field houses for construction crews.

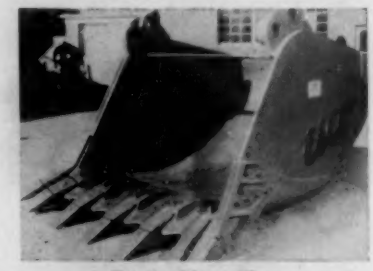
Both pre-fabricated buildings are said to provide safe storage for tools and equipment while being simple to assemble and dismantel for moving. The 7 ft. by 7 ft. by 7 ft. unit has double doors 4-ft. wide, ventilating window and doortop louvres and two pegboards for tool hanging. Extender sections of 2 ft. each are available to give additional length as required. Another, larger unit features flexibility which permits floor plans to be laid out for specific requirements. This basic unit comes in lengths of 7 ft. 6 in., 10 ft., 15 ft., and 20 ft., with additional extender sections available in 5 ft. lengths. Widths range from 11 ft. 3 in. to 22 ft. 6 in. and sidewall heights are 8 and 10 ft.

Martin Steel Corporation, Mansfield, Ohio.

For more details circle 142 on Enclosed Return Postal Card.

4½ Yd. Hoe Dipper

A 4½ yd. hoe dipper has been announced by Electric Steel Foundry Company. The huge hoe is equipped with sidecutters to carve a trench 81 in.



Esco's Giant Hoe

wide. It will be used on a new American 900 series machine. Also recently produced is a pair of 81 in. hoe dippers of 3 yd. capacity. The 3 yard hoes will be used on P & H 1055 machines.

Electric Steel Foundry Company, 1017 Griggs Street, Danville, Ill., or 2141 N. W. 25th Ave., Portland 10, Ore.

For more details circle 143 on Enclosed Return Postal Card.

Grease Cartridge

A new, easy-loading grease cartridge packed with a multi-purpose lubricant and fitting all cartride type grease guns is now available from Gulf Oil Corporation.

The "E-Z Load Cartridge" lubricates neatly and economically, and is a convenient timesaver in numerous applications on both stationary and rolling equipment, the manufacturer states. Packed with Gulflex A, multi-purpose lithium base grease, the cartridge offers a quick insert-use-discard method of handling to simplify lubrication and reduce grease loss. Also, special leak-resistant sealing is said to eliminate contamination by grime and grit.

Gulf Oil Corporation, Department DM, Gulf Building, Pittsburgh 19, Pa.

For more details circle 144 on Enclosed Return Postal Card.

Continued on page 155

Wants dependable source for Asphalt --buys from STANDARD OIL

Sarrington Construction keeps on schedule, gets other benefits from using STANDARD Asphalt

When you put down 8.3 miles of Asphalt in nine working days, your materials have to *be there* when they're needed. Sarrington Construction had at least two good things working for them when they contracted to pave a section of Wisconsin State Highway 49, southeast of Ripon. They had (1) a dependable source of supply for Asphalt and (2) on-the-spot assistance from an experienced Asphalt man. They had contracted for STANDARD Asphalt.

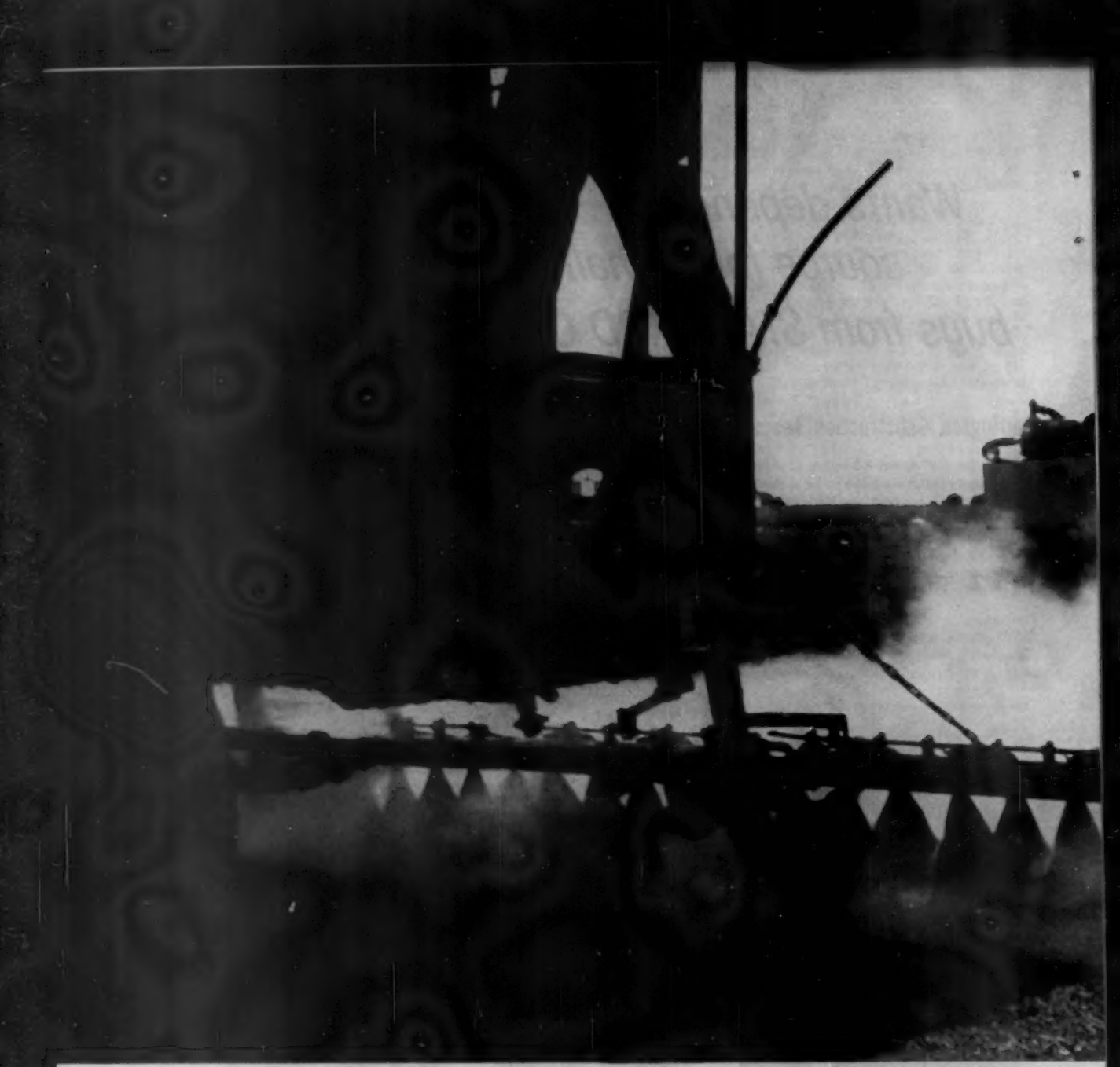
Deliveries of 85-100 grade STANDARD Asphalt came to Sarrington's continuous mix plant on schedule from Standard's Whiting Refinery 195 miles away. This is one of four strategically located Standard Oil refineries Sarrington could draw upon for deliveries. From Milwaukee came Frank Cocking, an experienced Asphalt salesman with 25 years' service with Standard.

Delivery on schedule, well located Asphalt supply sources, technical service by experienced men, attention to contracts when Asphalt is in short supply as well as when it is plentiful. This is what Sarrington Construction gets by buying from Standard Oil. You can get this sort of service, too. Call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.**

. . . for more details circle 345 on enclosed return postal card

You expect more from STANDARD and you get it!

Having someone who knows Asphalt construction on hand when you're putting down the road can be a help. Frank Cocking discusses how job is going with David Gasser, Sarrington Construction owner-partner. Here contractor is laying three inch pavement—1¾ inch binder, 1¼ inch wearing surface—on 22 ft. width. David Gasser directs firm's highway paving work. Partner John Scott supervises rest of Sarrington's operations throughout Wisconsin, applying STANDARD Asphalt in Sealcoat work.



Proving the improvements in

The highway re-paving crew above is laying a section of state road that will add another page of field test results and data in the growing file on Armour's road construction chemicals.

Since Armour first developed chemicals for improving asphalt paving, Armour research men have been constantly at work proving the improvements. This testing aided development of two groups of outstanding paving chemicals; **Redicote®** compounds, anti-stripping agents for asphalt cements and cutbacks; Armour *Cationic* Asphalt Emulsifiers for emulsified asphalts.

REDICOTES—Armour Redicotes improve adhesion of asphalt onto any aggregate. Redicotes make every kind of weather good asphalt-paving weather. No wait for drying after a rain . . . no wait for morning dew to dry. Redicotes are economical because it takes so little to do a job. In some cases as small a concentration as 0.2% will give complete coating and insure anti-stripping properties. Armour Redicotes offer additional satisfaction with guaranteed uniformity in batch after batch. Redicotes . . . make asphalt adhere better . . . cost less and are quality controlled.

Armour road construction chemicals

ARMOUR'S CATIONIC ASPHALT EMULSIONS—Armour cationic emulsifiers ionize in solution to give positively charged particles. The "break" of these cationic asphalt emulsions may begin to take place the moment of contact or may be delayed to suit particular requirements. Surface or atmospheric conditions have little effect on the break or the adherent properties of the emulsified asphalt. The bond is such that it displaces water on the surface and prevents stripping. Emulsions made with Armour cationics give you: controlled break-time . . . ease of emulsification . . . built-in anti-stripping.

. . for more details circle 278 on enclosed return postal card

As testing continues and new improvements are found, they will be subjected to the same rigid tests that have made Armour chemicals highly efficient and economical.

For additional information about these road construction chemicals, talk to Armour's chemical specialists or write for samples and these booklets: "Redicotes," "Armour Cationic Asphalt Emulsions."

ARMOUR INDUSTRIAL CHEMICAL COMPANY
A DIVISION OF ARMOUR AND COMPANY
110 North Wacker Drive, Chicago 6, Illinois

An example of Massachusetts new thin hot-mix Class I, Type S.T. bituminous concrete surface treatment. Appearance after one year in service (Route 140, Taunton).

Hot-Mix for Thin Surface Treatments

By Egons Tons and John Chin

Mr. Tons is Assistant Professor of Transportation Engineering, Massachusetts Institute of Technology. Mr. Chin is Research Engineer, Massachusetts Department of Public Works. This summarizes a Joint Highway Research Project of the authors' respective organizations. It represents a slight abridgement of a paper presented at the 45th annual meeting of the American Association of State Highway Officials, Boston, Mass., October 12-16, 1959.

Bituminous Roads And Streets

In Massachusetts, early results from test sections put a "looks good" rating on half-inch carpets, made with small-aggregate dense-graded bituminous concrete.

Surface treatment work in Massachusetts comes under maintenance and is done to rejuvenate the riding surface of old pavements. Cracked, raveled and dried out surfaces have usually been restored for an extended service life by a conventional seal coat using a single binder and stone chip cover application.

Cutbacks, emulsions as well as penetration grade asphalts have been used. While there have been many miles of successfully laid surface treatments of this type, there have also been numerous disappointing failures.

There are several reasons why conventional surface treatments or seal coats cannot be successful every time. While it is often argued that improved controls and application techniques should always produce a good seal coat, it must be pointed out that the era of scientific seal coat design is not with us as yet. By this the authors do not wish to say that a properly designed seal coat is an impossibility, but only suggest that other methods of achieving the same goal could be preferable.

The success of a "stone chip" surface treatment depends upon factors such as traffic, weather, condition of old surface, viscosity of binder at time chips are applied, type and condition of cover stone, amount of cover stone, and the personal equation of the engineer or supervisor.

Each factor has further variables which will be discussed later. Difficulties in controlling them have lead into inquiries about other methods of resurfacing.

In order to minimize the number of failures, precoated seal coat chips have been tried. This was a first step towards better and more centralized control. In several states, including Massachusetts, the development of reliable and efficient hot mix plants where the quality of mix can be controlled has led to experiments with hot bituminous concrete surface treatments. One of the problems confronting the engineer was how to place a thin (½ in. or less) layer of bituminous concrete using conventional machinery. There were doubts whether this could be done at all; such a thin coating could be difficult to spread over high spots.

Experience has indicated that thin surface treatments using a dense hot bituminous plant mix can be laid successfully by regular bituminous concrete finishing machines. The actual detailed procedure in Massachusetts will be described.

Specifications for the Massachusetts Class I Type S.T. bituminous concrete used in the surface treatments are given in an accompanying table. They are a modification of the regular Class I dense mix, long used. To make it more workable for thin surface treatments, the top size aggregate has been reduced to all passing the ⅜-in. sieve. The amount passing the No. 10 sieve has been increased slightly with no rise in binder content. The binder used is 85-100 or 100-120 penetration grade asphalt.

In order to point out the advantages and disadvantages of each type of surface treatment, the requirements as outlined at the beginning of the paper will be discussed.

1. Economy cost. One of the main obstacles to the use of a hot plant mix for surface treatments has been its relatively high initial unit cost. It appears that the price gap is narrowing down in Massachusetts, reaching in one case about 23c per sq. yd. as compared to 17c for binder-chip treatments. Even though the initial cost is higher for the plant mix, the low maintenance cost and longevity might tip the balance. Furthermore, hot mix resurfacing is less likely to fail during, or a short time after construction.

2. Safety. In terms of safety, both types might be comparable when properly designed. A disadvantage of the stone chip seal coat is that individual pieces of rock can be picked up by traffic. Also, binder frequently appears on the surface, either through loss of cover aggregate or by bleeding, and causes a slippery condition.

On the other hand, since successful chip seal coats assume the color of the aggregate, light reflective surfaces can be obtained. A hot mix surface treatment usually will

Applying the thin surface-treatment mix carpet with a Barber-Greene finisher.

be darker in color.

3. Smoothness and quietness. Here the hot mix has advantages. The finishing machine, set for a certain level, helps to smooth out slight indentations as it goes along; with a chip seal coat, binder and stones are applied in a uniform layer. Road roughness measurements are still needed to test the riding improvement. Recent measurements have shown that a hot-laid surface treatment is quieter under traffic.

4. Appearance. The appearance of both types can be pleasing and uniform, except that there is a fair chance that loss of stone chip cover or part of it will cause an irregular surface. In populated areas where street sweeping is practiced, the smooth, hot-surfaced road is easier to keep clean.

5. Increased Structural Strength. Due to the monolayer system of a stone chip seal coat, very little increase in structural strength of pavement is achieved. Although it is difficult to calculate the actual increase in load carrying capacity when a ½-in. bituminous concrete layer is added to old pavements in different conditions, it is reasonable to assume that the pavement strength is increased.

6. Tight Surface Against Water. Here both types of surface treatments are similar. Large cracks in the underlying pavement ususally reflect through in both soon after they are applied.

7. Ease of Construction. During chip seal coating work, special care and luck are often needed for a success. By a comparison, a plant mix is easier to apply:

Traffic can be let on as soon as the bituminous concrete has been rolled and cooled. Since the layer is thin, it cools fast. Experience in Massachusetts has shown that when emulsions or cutbacks are used as binders in a chip seal treatment, it is necessary to keep traffic off for a considerable period.

For various reasons surface treatments are often placed in the fall when weather becomes quite unpredictable. While bad weather can also influence the quality of a hot mix surface treatment, the sensitivity to weather of a stone chip seal coat (at the time of con-

Continued on page 147

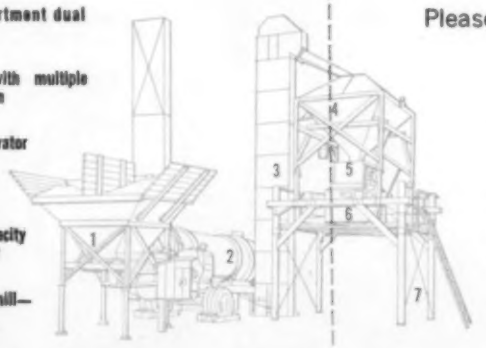
TABLE 1

Massachusetts Motorists' Verdict
Interview Score for Conventional Binder-Chip vs Hot Mix Treatments

Wanted	Detailed	Chip Seal Coat	Hot Mix
Economy	Initial cost of construction low	yes	?
	Infrequent construction failures	no	yes
	Maintenance lowered, longer useful life	?	?
	Total unit cost low	?	?
Safety	Surface–tire friction high	yes	yes
	Night reflection good	?	?
	Free of loose (flying) rock pieces	no	yes
Riding	Smooth Surface	?	yes
	Quiet Ride	?	yes
Appearance	Uniform in appearance	?	yes
	High quality appearance	?	yes
Increased Strength	Structural strength of pavement increased	?	yes
Surface Sealing	Tight surface against water, oxygen, etc.	yes	yes

The rugged Littleford Asphalt Plant is built to do the job . . . gives big plant quality mixes at small plant costs. Savings of 40% on producing bituminous black top are possible because you control the mix from pugmill to pavement. No more costly delays and waiting for trucks to arrive with the hot mix . . . with the Littleford Model 121-30 you have a plant with the flexibility and versatility to produce all types of black top mixes at the lowest possible cost. Only the Littleford Plant incorporates so many new and improved designed features and offers such a complete line of auxiliary equipment for you to custom-make a plant for your operations. You receive all the profits with **A LITTLEFORD MODEL 121-30 ASPHALT PLANT.**

1. 5-ton, 2-compartment dual feeder bin
2. 30-ton dryer with multiple flight construction
3. Enclosed hot elevator
4. Storage Hopper
5. 10 cubic foot capacity Batching Hopper
6. Twin Shaft Pugmill—1000 lb. batch
7. Self-elevating platform



Please send information on the **Asphalt Plant**

name .....

address .....

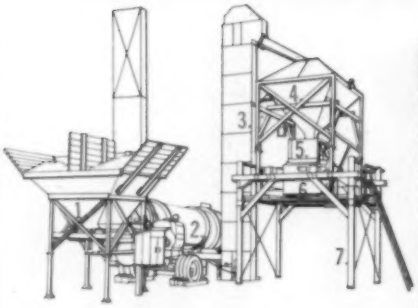
city *zone* *state* .....

name of firm .....

position *telephone number* .....

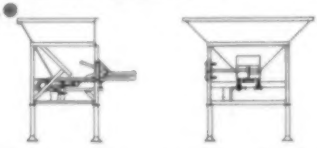
Littleford offices in Cincinnati, Ohio and Albany, New York

HERE'S A SMALL ASPHALT PLANT THAT GIVES YOU BIG PLANT RESULTS



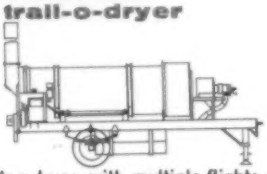
The Littleford plant incorporates many new and improved designed features that are not found on any other plant of this size. No other plant has the complete line of auxiliary equipment for you to custom-make a plant for your operations . . . you receive all the profits.

1. model 5-t-25 dual feeder bin



The 5-ton, two compartment dual feeder bin has a reciprocating feeder which feeds the aggregate in predetermined amounts directly into the dryer.

2. model 30t trail-o-dryer

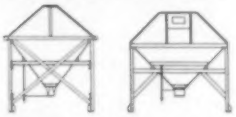


The 30-ton dryer, with multiple flights construction, produces an "Even-Veil" of aggregate across the drum permitting quick drying, and heating of the aggregate. The combustion area is constructed of tough, heat resistant "Cor-Ten" steel. Fuel oil or gas burner available.

3. model he-30 hot elevator

The enclosed hot elevator delivers a continuous cascade of hot, dry aggregate from the dryer to the storage hopper at a rate up to 30 tons per hour.

4. model sh-100 storage hopper



Storage hopper holds and discharges dry aggregate into batching hopper.

5. model bh-10 batching hopper

Batching hopper has a 10 cubic foot capacity (1,000 lbs.) for measuring one batch for the pugmill. Weighing scales available if desired.

6. model pm-10 pugmill

The twin shaft pugmill equipped with adjustable paddles is positioned directly below the batching hopper. An asphalt flow meter determines the correct amount of asphalt pumped into the pugmill.

7. model ep-30 elevating platform

The self-elevating platform permits discharging of bituminous black top directly into waiting trucks.

LITTLEFORD

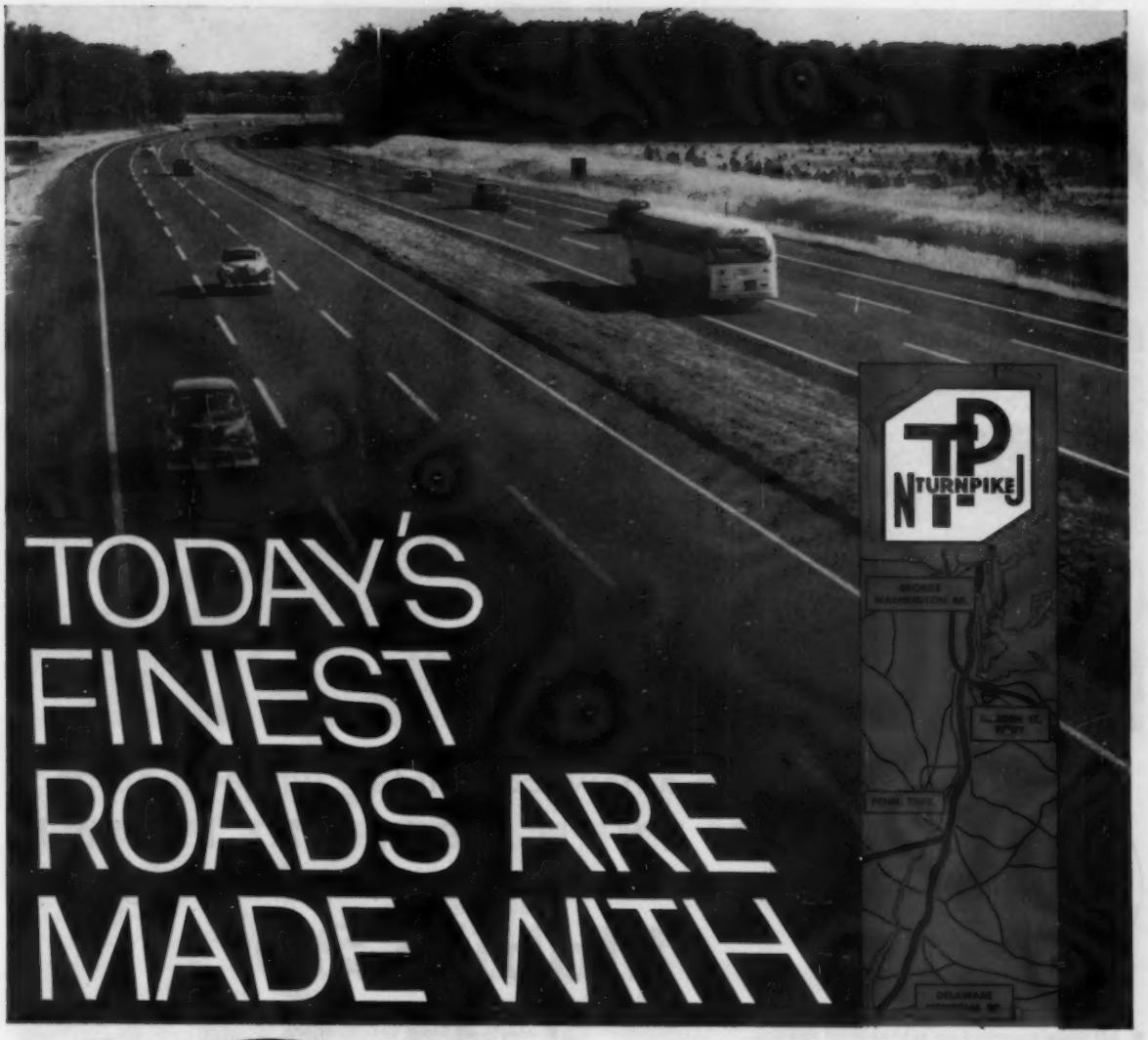
FIRST CLASS PERMIT No. 23 (Sec. 34.9 P.L.&R.) Cincinnati, Ohio

BUSINESS REPLY CARD

postage will be paid by

LITTLEFORD Bros., Inc. AIRMAIL

453 EAST PEARL STREET, CINCINNATI 2, OHIO



TODAY'S FINEST ROADS ARE MADE WITH ASPHALT

Asphalt furnished by Esso was used in the construction of the New Jersey Turnpike and saved more than $46,000 per mile over slab type pavement – and every year will bring added savings through lower maintenance costs. Consider these advantages in your road building plans:

Unsurpassed quality – Asphalt produced by Esso is specially refined to give pavements integral strength and flexibility – with maximum strength to resist heavy axle loads and extremes in temperature.

Faster construction time – Roads paved in ribbons are completed faster... do not require curing time, forms, and curing equipment.

Less capital tied up – Contractors can meet faster construction schedules and obtain contract payments more quickly.

Less interruption of traffic – On new construction as well as in resurfacing or widening of old roads, traffic can be routed over finished work without delay... for greater safety to workmen and motorists.

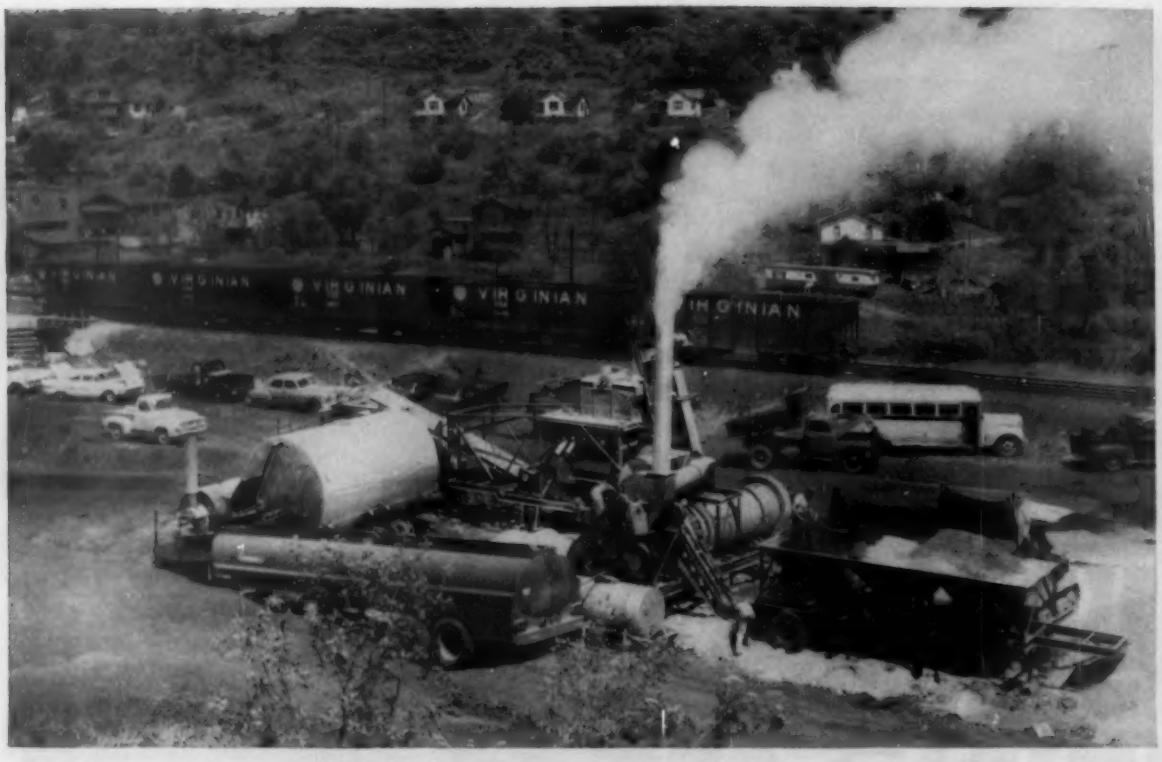
Any road, street or turnpike, paved with Asphalt costs less to build . . . costs less to maintain . . . gives a smoother, quieter ride . . . gives more miles, safety and comfort for the taxpayer's dollar over slab type pavements. For more information write: Esso Standard, Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, New York.

Esso

ASPHALT PRODUCTS

In Industry after Industry..."ESSO RESEARCH works wonders with oil"

. . . for more details circle 298 on enclosed return postal card



announces a new, completely wheel-mounted

BATCH TYPE ASPHALT PLANT

. . . in the 40 to 70 ton capacity range

Mobile 20

- **All units mounted on rubber tired trailers.**
- **No crane needed for erection or dismantling.**
- **All piping and wiring permanently installed.**
- **All remotely located units driven by electric motors.**
- **Diesel engine and generator for operating all electric motors.**
- **Meets all State specifications.**
- **Cold material hoppers with reciprocating feeder and conveyor belt.**
- **Dryer complete with Diesel engine, exhauster and dust collector.**
- **Portable insulated hot asphalt tank with oil heater.**
- **No shafts, universal joints, chains or gears.**

Now, for the first time, all the advantages of completely wheel-mounted batch type asphalt plants are available in the 40 to 70 ton capacity range. This H&B Mobile 20 is truly the last word in mobility. It can be made ready to move in a matter of minutes, and is ready to go to work as soon as it arrives at the new location.

The entire plant is mounted on rubber tired trailers. All wiring and piping is permanently installed, with quick disconnects. Flexible hose and electric connections between permanent piping on the various units make possible quick connections in the field. This flexibility of arrangement makes it possible to adapt the Mobile 20 to special ground site advantages or limitations.

H&B completely wheel-mounted batch type plants are also available in two larger capacity ranges: Mobile 40 (120 to 140 tph) and Mobile 60 (160 to 225 tph).

Bulletin M-58 sent on request.

HETHERINGTON & BERNER INC. • 701-745 Kentucky Ave., Indianapolis 7, Ind.

Export Department, 205 W. Wacker Drive, Chicago 6, Illinois

A wholly-owned subsidiary of American Hoist & Derrick Co.

Also builders of the newly designed Series B batch mix plants with batch capacities from 2,000 to 8,000 lbs., and Moto-Paver, the combination traveling mixer-paver that does the complete mixing and paving job in one continuous operation.

. . . for more details circle 317 on enclosed return postal card

Continued from page 142

struction) cannot be over-emphasized.

For both types of resurfacing, the old surface should be reasonably clean before the new cover is applied. A hot mix treatment usually requires a tack coat, while stone chip seal does not.

Viscosity of the binder can easily be controlled in a plant, and good adhesion between asphalt and mineral obtained. The proper viscosity for wetting stone chips in a conventional seal coat is more difficult to regulate, especially when penetration grade asphalts are used.

Distribution techniques and machinery for the binder and chip surface treatment have been improved lately. In many cases, however, the texture and other characteristics of the old surface are not regular and a uniform application of the binder will not appear even on the road.

The cover stone in a chip seal coat should be non-stripping, crush resistant, non-polishing and non-abrasive. The particles should also be uniform in size and free from dust and excess moisture at the time of application. The aggregate in a hot mix must be of a similarly high quality but controlled grading, drying and mixing in the plant, make it easier to obtain the desirable characteristics.

The amount of cover stone in a chip seal coat may influence the final outcome: in case of excess the loose pieces act as wedges which dislodge the imbedded stone.

The engineer in charge of a chip seal coat construction has a great responsibility. He cannot refer to detailed specifications or formulas because each condition is different and seal coats cannot always be manufactured according to previous plan. Attempts have been made to bring the laboratory closer to the road; with time, no doubt, a more scientific approach will be developed. Such a process might or might not increase the cost of a seal coat, but it still will not eliminate several variables difficult and even impossible to control (such as weather).

In case of a hot mix, the basic process of bringing the aggregate and the binder together is well controlled in the plant. The mix is placed and compacted according to certain standard procedures. This cuts the variables.

It appears reasonable to say that plant mix is very promising, and may soon replace stone chip seal coats in Massachusetts.

Table 2

New Massachusetts Method, Construction-Wise Comparison of Conventional Binder-Chip and Hot Mix Surface Treatments

Precautions and Measures	Chip Seal Coat	Hot Mix
Traffic can be usually let on right away	no	yes
Weather plays minor role in success	no	yes
Old surface texture may vary widely	?	yes
Viscosity of binder is easy to control	no	yes
Any type of mineral aggregate can be used	?	?
Only few variables are left to the field engineer	no	yes

Details of Hot Mix in Test

Massachusetts Class I Dense Bituminous Concrete, Type S.T. as Used in the Surface Treatment Experiments

GENERAL COMPOSITION OF THE MIXTURE

The mineral aggregate, filler and binder are proportioned and mixed to meet the following composition by weight:

STANDARD U.S. SERIES SIEVES		*PERCENT BY WEIGHT*	
Passing	*Retained*	*Min*	*Max*
⅜"		100	
⅜"	No. 4	5	15
No. 4	No. 10	15	30
No. 10		60	70
No. 10	No. 20	10	20
No. 20	No. 40	10	22
No. 40	No. 80	10	22
No. 80	No. 200	5	12
No. 200		3	6
Binder		7	8

The minimum and maximum delivery temperatures are 275F and 300F respectively.

MINERAL AGGREGATE AND BINDER

The portion retained on No. 10 sieve is considered as coarse aggregate. Clean, crushed rock consisting of angular fragments obtained by breaking and crushing solid or shattered natural rock, free from thin elongated pieces is required.

Sand or sand-screening mixture is allowed as fine aggregate. The sand has to contain clean, hard, durable grains, meeting the following grading requirements:

Passing ⅜ inch Sieve 100%
Passing No. 10 Sieve 85%

The sand must be pre-screened on a ⅜ in. sieve to remove larger particles. The stone screenings must be a clean product of secondary crusher without an excess of fines.

Limestone dust, portland cement or other approved stone dust can be used as mineral filler. Must pass No. 40 sieve, and at least 65% pass No. 200 sieve.

Binder: usually 85-100 penetration asphalt.

The authors express appreciation to J. E. O'Neil, research and materials engineer, research and materials division for his cooperation. Thanks are also extended to numerous others from the department

Continued on page 150

BARBER-GREENE BATCHOMATIC PLANT

HOW TO GET TOP FROM YOUR NEW

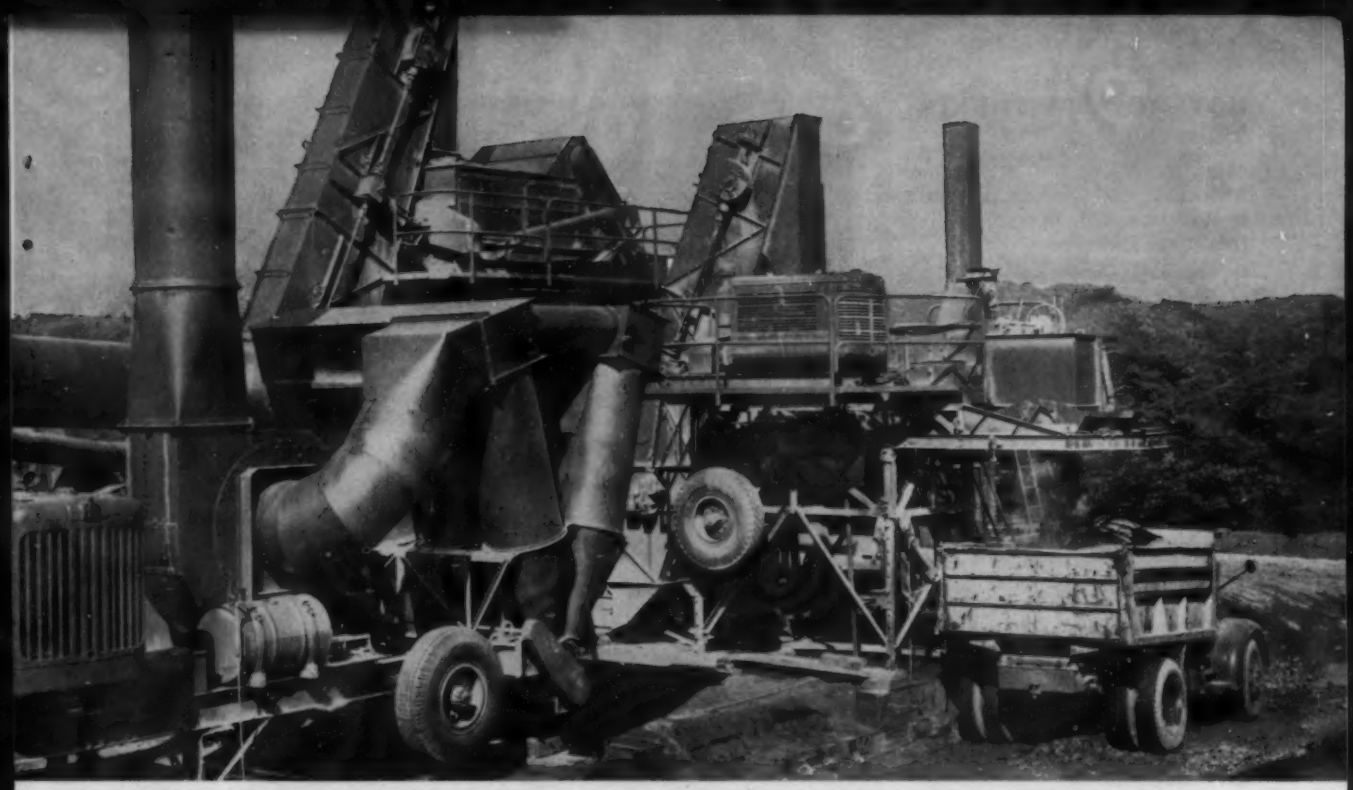
Invest after getting full facts on which of 17 Barber-Greene continuous mix and batch plants is custom fitted to your needs

Before you buy a new asphalt plant, spend a few moments learning whether a continuous mix or batch-type plant can produce the top tonnage and profits for your operating conditions.

And you can be sure of getting full facts on both type plants from the man who sells 17 sizes of continuous mix and batch plants—your Barber-Greene distributor. He does no short line selling, but rather can analyze your operation and pencil out the profit picture on the type plant he recommends.

Should his analysis show a Barber-Greene Continuous Mix plant is your best investment, you get these 10 benefits: 1) up to 10% savings on initial plant costs; 2) sustained high production at lowest per ton cost; 3) up to 10% lower operating costs in horsepower and fuel savings; 4) up to 10% lower maintenance costs per ton; 5) higher resale value; 6) less skilled operators required; 7) continuous preset proportioning accuracy; 8) fastest of any plant average setup time; 9) buy and use only components needed for a specific job; and 10) move and use only components needed for your next job.

Should your operations be best served by your size Barber-Greene BatchOmatic, you get all these exclusive features: 1) only completely new and proved automatic plants—no warmed-over designs; 2) push-button mix changes with no penalty for automatic operation; 3) most rugged and reliable automatic control system cuts downtime in half; 4) greatest production per dollar of plant investment; 5) all movement in new deeper, shorter pug mill is mixing action giving most thorough mixing in less time; 6) fastest discharge from largest pug mill opening plus fast hydraulically activated gate; 7) up to 10% more tonnage hourly with advanced cycling principle; 8) over 25% greater sand screening capacity; 9) completely pre-wired plant is standard equipment; 10) completely hydraulic operation is standard



BARBER-GREENE CONTINUOUS PLANT

TONNAGE, PROFITS ASPHALT PLANT

equipment—no need of auxiliary air compressor; and 11) plant comes completely assembled in sections for fastest erection, disassembly.

If you need a power control or manually operated batch plant, you can choose from eight equally productive models in the reference chart.

Spend a little time with your Barber-Greene distributor before you buy any asphalt plant. You'll find it's the wisest investment you ever made.

One of these Barber-Greene plants gives you top tonnage, profits

CONTINUOUS MIX		BATCH-TYPE		
Model	TPH Range	BatchOmatic Model	Power Control	Manual Model
840-B	55	2000 lbs.	892	2000 lbs.	890	1000 lbs.
845	90	3000 lbs.	893	3000 lbs.	891	1500 lbs.
847	160	4000 lbs.	894	4000 lbs.	892	2000 lbs.
848-A	250	5000 lbs.	895	5000 lbs.		
		6000 lbs.	896	6000 lbs.		

Only Barber-Greene offers four different finishers plus a new versatile road widener —equipment sized for all your needs.

. . . for more details circle 283 on enclosed return postal card

World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.

Plants in DeKalb, Illinois..Detroit .Canada .England. Brazil..Australia

HOT MIX TREATMENTS

Continued from page 147

of public works and to the members of the M:I:T: staff, particularly Professor A. J. Bone for help in this study and report.

Treatment Try-Out Details

The first experimental Massachusetts project using Class I Dense Bituminous Concrete as a seal took in a 3,000 ft. section. The pavement so treated was an 18-ft. wide concrete base built in 1921 that had been widened by shoulder stabilization and several tar and asphalt stone chip treatments to 24-ft. width.

The shoulders which averaged one to two inches below the road surfaces, and also some roadway depressions, were brought up to level using about 153 tons of mix. The actual surface treatment mat required 196.5 tons of mix or about 0.0245 tons per sq. yd. (average thickness 0.42 in.) The old surface was not tack coated.

The bituminous mix was spread by a Barber-Greene finisher and rolled with an 8-ton Buffalo Springfield tandem roller. After the first two loads the crew readily adapted; no difficulties were encountered. Traffic was kept off for almost an hour. Air temperature was in the 70's, fair and sunny.

The appearance and riding qualities that resulted were similar to those of a regular 3-in. bituminous concrete resurfacing. The cost was 35c per sq. yd. along the longitudinal joints and transverse cracks; also a few erratic hair cracks over the stabilized shoulders. (This old road section was quite rough, and presented a difficult test for the new method.)

Surface texture of the hot-mix surface treatment after one year in service (Route 140, Taunton).

Two other trial sections, not here detailed, were found in excellent condition with no cracks after five months' service during the 1959 summer. All three sections are smooth riding and it is difficult to tell them from Massachusetts Class I two course 3 in. bituminous concrete resurfacing.

With this encouragement, more surface treatment is planned by the department of public works. About 25 additional sections totaling some 30 miles of two-lane roads in various parts of the state were assigned for hot mix resurfacing in 1959 and 1960. To evaluate the performance, a photographic condition survey method was developed which permits photographing and analyzing long stretches of road. Films from different surveys can also be easily compared. Noise level and roughness measurements will be made to supplement the photographic record.

New Jersey Plans Record Program

The New Jersey highway department has requested more than $287 million in state and federal funds —the largest departmental budget in the history of the state. Highway commissioner Dwight R. G. Palmer's bid for state appropriations, totaling $215,000,000 for 1960-61 is more than half of the entire state budget.

Table 3

Quick Facts on the Three Massachusetts Test Sections

Town	Route	Costruction Date	Length (ft.)	Width (ft.)	Type Base	Surface Repairs	Amount Tack Coat (gal./sq. yd.)	Average Thickness (in.)	Cost per sq. yd. ($)
Taunton	140	9/58	3,000	24	18' W. P.C.C.	yes	none	0.42	0.35
Sandisfield	8	5/59	15,000	18	T.M.A.	no	RS-2 0.055	0.625	0.343
Monson	32	5/59	22,000	20 to 24	B.M.A.	no	RS-2 0.03	0.44	0.227

Asphalt Road Tests Give Suggestions for Durability

Suggestions for obtaining better durability for asphalt roads have resulted in research that has continued for five years.

The research is being conducted by the Texas Transportation Institute for the Texas Highway Department.

Laboratory and field studies of the changes in the physical properties of asphaltic materials in a number of test roads are in progress. Findings made to date under supervision of Bob M. Gallaway have provided construction information as follows:

Double surface treatments are highly satisfactory when properly constructed.

As traffic density and weight increase, base density is increasingly important.

Cover stone should be large, probably no smaller than size 5 and it should be considerably more restricted in grading.

Heated aggregate for all surface treatments in any kind of weather is a very definite advantage and assures a high percentage of successful jobs.

For heated aggregates the harder asphalts are preferred, the OA-90's and AO-135's.

Stone embedment should be 30 to 50 percent.

Pneumatic rollers serve more efficiently than steel rollers for attaching the stone to the asphalt.

Loose stone not stuck by the roller should be swept free of the traveled road surface immediately after completion of rolling.

Structural Steel Tonnage to Be Up

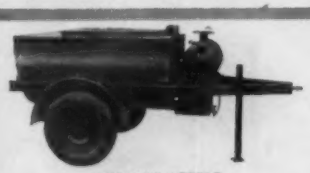
The 1960 decade promises an increased demand for fabricated structural steel, predicts H. B. Dietrich, president, American Institute of Steel Construction. Continuous research and new design techniques spur this increase, and fabricators have improved and expanded their facilities to handle tonnage.

For the year 1960 fabricated structural steel bookings are expected to reach 3,500,000 tons representing a half-million ton increase over 1959. Shipments are expected to total 3,400,000 tons.

BITUMINOUS DISTRIBUTOR
Front or rear mounted for truck or trailer . . . with pressure metering.

MAINTENANCE UNIT
Heating and spraying unit . . . 2-wheel or truck mounted.

STREET FLUSHER
Truck mounted as shown or 2-wheel model for towing.



ASPHALT KETTLE
2-wheel pneumatic mounted . . . hand or power spray.

Smartest buys of the year

ROSCO ROAD EQUIPMENT

for construction and maintenance of highways, streets and airports

ROLLER
9-wheel self-propelled . . . torque converter, power brakes and steering.

ROSCO-PACTOR
9 or 13 wheel roller . . . 90 to 125 cubic feet capacity.

ROAD SWEEPER
Two-way . . . power driven . . . full 4-wheel trailer mounted.

STREET CLEANER
Power driven . . . for sweeping and flushing.

Years of use by satisfied customers prove Rosco machines are built to last . . . built to turn out a top-notch job every time. For full details on the dollar-saving specifications ask for literature on the equipment you need.

ROSCO MINNEAPOLIS

ROSCO MANUFACTURING CO.
3118 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

☐ Bituminous Distributor ☐ Street Flusher ☐ Roller ☐ Road Sweeper
☐ Maintenance Unit ☐ Asphalt Kettle ☐ Rosco-Pactor ☐ Street Cleaner

Please send literature checked below to:

Name_____ Title_____

Company_____

Address_____

City_____ State_____

. . . for more details circle 339 on enclosed return postal card

Views And Comments

By H. G. Nevitt

Everyone Can Help

Our most recent articles have reviewed the fundamental problems in a rational yet practical approach to the design of flexible pavements. We hope we have stimulated the interest of engineers in the subject, and we believe that everyone connected with highways can aid in developing such an approach. We think that such help from the rank and file of highway engineers and administrators, rather than merely leaving the problem to the research and design groups, will greatly accelerate our progress to this much needed end. As a preliminary to suggestions concerning such aid we would like to review the general situation as developed in our previous discussions, and add some other comments which appear applicable.

The development of a logical basis for a sound thickness design is confronted with many obstacles. In most engineering work a theoretical analysis brings out the factors involved, their probable interrelationships, and how the influence of each can be investigated. Well known engineering approaches can generally be used in the study. While problems, difficulties and similar factors generally appear, in the usual situation the end result is obtainable provided the economics justify the efforts required.

Analyzing highway pavement structures is quite different. There are no generally accepted relationships describing the influence of each of the variables. A number of such have been proposed, but the majority of technologists seem to believe they are based on untenable assumptions or do not conform with field observations or otherwise are unsatisfactory for use. This makes it extremely difficult to study the problem except through full scale experiments in which each variable is modified independently.

Experience shows that even this approach at times encounters difficulties. To study the effect of loads, you obviously need to utilize heavier sections. Just how do you proportion the heavier section so as to obtain a comparable change which points out the additional thickness required due to the increased load alone? If the interactions of the various elements in the structures are not clearly understood, the new optimum thickness may be influenced by interstructure relationship changes as well as the heavier loading.

Another troublesome factor is the matter of failure definition. Few engineers agree exactly as to what constitutes a failure, or just when the road has reached the failure point.

Two other important factors which are presently simply ignored in any regularly used design procedure of which we are aware are fatigue and flexibility. Incidentally, the two are not interchangeable characteristics, although closely inter-related and therefore often treated together, even to the point of being confused with each other by some engineers. High repetition of rather low stress intensities is characteristic of highway stresses. Loading calculations recognize this, but only in research approaches have the effects of such stressing on the resistance characteristics of the pavement been considered. In resisting these repeated stresses, strain is involved and the amount of this strain is determined by the base soil and pavement characteristics. Obviously a rational design procedure should take into consideration the anticipated magnitude of this strain. It should produce a structure which can withstand the strain initially without distress—that is, have flexibility—and likewise do so repeatedly—that is, also have fatigue resistance. Probably both these characteristics will for the present have to be allowed for in the permissible stress limits, but they are indicative of the area which remains to be thoroughly explored in this field of mechanics.

Despite these difficulties the problems are being attacked and (we hope) slowly being overcome. An essential factor in the approach must, however, be a clear understanding of just what variables affect the outcome, because no fair conclusion can be drawn or the influence of each variable evaluated without the magnitude of each of these effects being brought in. This is the reason for our earlier discussions of the basic elements in the pavement structure, and our view of the principal problem involved in each.

Can the man concerned with highway engineering who is not directly involved in research or design help in this situation? In our view he can, if he understands the basic problem and approaches it correctly. Due to its complexity, differentiating between the influences which are responsible for any particular failure is extremely difficult. Usually more than one effect is responsible, at least to some extent, for the end result. It is con-

Continued on page 154

THE SIMPLICITY S-80 ASPHALT PLANT

LOWEST COST

PARTICULARLY ON

25,000 ton

to

50,000 ton

PROJECTS

Simplicity plants are more dependable . . . they last longer, require less men, maintenance and fuel . . . and they produce more and better asphalt paving mixtures, at less cost, than any other asphalt plant built by anyone, anywhere, at any time.

In 1953 Walter Richardson, Jr., (Interstate Construction Company) started in the plant mix asphalt business in Nashville, Tennessee, with a Simplicity asphalt plant. In six years his highly successful companies have acquired four Simplicity plants . . . three are Model S-80.

Why Simplicity Model S-80? Because he has proved . . . time after time . . . that S-80 produces at lowest cost on 25,000 to 50,000 ton projects where competitors must move to the job . . . and has further proved that it can meet and beat competition on considerably larger jobs. The S-80 plant can be dismantled, moved any distance and re-erected as fast and economically as any asphalt plant of its capacity on the market.

DEPENDABLE

THE SIMPLICITY SYSTEM

FROM BUILDER TO BUYER BETWEEN MEN WHO KNOW

THE SIMPLICITY SYSTEM CO.

SHOLAR AVENUE PHONE MAdison 2-2144

CHATTANOOGA 6, TENNESSEE

. . . for more details circle 344 on enclosed return postal card

NEVITT
Continued from page 152

sequently the thinking of many technologists that only through test sections on which all the factors are independently controlled and varied, can the job be done. This is certainly true unless there is a considerable amount of data.

If, however, enough information is made available in which failures from all important causative factors are represented, the influence of any one factor should be obtainable since in comparisons in which this factor is varied all other influences should cancel out.

If every aspect of the design situation on each project is evaluated and tabulated, along with a case history of the result from the design in use, we should eventually develop a clear understanding of the influence of each factor. Engineers have been struggling with this problem for many years and if such data had been accumulated over this period, we might have the answer we are still seeking.

Accurate...Dependable...Economical
PLUS PAYLOAD BONUS!

Look at these capacities! When an Etnyre FX-500 distributor is mounted on a tilt cab chassis:

1500 gal to meet 18,000 lb axle limit
1760 gal to meet 20,000 lb axle limit
2100 gal to meet 22,400 lb axle limit

Similar increased maximums on semi-trailers and tandem axle mountings. And dependable operation . . . uniform, accurate distribution are typical of the results you can always expect from an Etnyre. No-streak spraying with clean, sharp edges is insured by Etnyre's exclusive triple-lap nozzle coverage.

Other FX-500 Quality Features:

- Hardened aluminum jacketing over 2" Fiberglas insulation which is reinforced with molded asbestos blocks.
- Stainless steel jacket near burners and exhaust stacks.
- Stainless steel pump heat jacket.
- Aluminum fenders and mud flaps.

You're familiar with Etnyre's accuracy and dependability . . . now you can get maximum payload too . . . for maximum profit. Investigate today — find out how a "Black-Topper" can handle more work, faster, better, more economically. Write E. D. Etnyre & Co., Oregon, Illinois.

SEE YOUR ETNYRE DEALER

ETNYRE
BITUMINOUS DISTRIBUTORS

. . . for more details circle 297 on enclosed return postal card

Court Decisions

Haulage Contract

After two and a half weeks of hauling highway construction material in Georgia, two truckers refused further performance. Insisting that in so refusing, the truckmen had broken their contract for hauling this material, the contractor sued for damages. The truckers on the other hand contended that they had been merely employed to haul this material at so much per load and that at the time they had ceased work this contractor owed them $1,577.90 and to that time had paid them but $100 each.

In its award of a judgment to these truckers for this amount the Georgia court said, "The general contractor knew at the time he employed them that the subcontractors had another job with another contractor to perform and would have to pull their trucks off the job in order to meet that commitment whenever the other contractor was ready for them.

"These truckmen denied that the arrangement with the general contractor was anything more than a day-to-day employment to haul dirt at so much per yard and so much per unit yard.

"The general contractor admitted that he owed them for the work they had done less the $100 advance to each and claimed that he was merely waiting to pay them until they advised him of the amount he owed them."

(Brown v. Carmanni, 110 S.E. 2d 548, Georgia, September 9, 1959)

Local Road Repairs

In the operation of a stone quarry more than 75% of the output was sold to counties and townships within the state for the maintenance of county roads. Only one of these roads was linked to a state highway. Jurisdiction of a labor dispute in these circumstances was refused by the National Labor Relations Board as the roads were primarily local and did not affect interstate commerce.

Kenneth Steva and Jessie Steva, Local 663, International Hod Carriers, etc., Union. Case No. 17-RC-2830, April 24, 1959

New Products

Continued from page 136

Rotary Mowers

Four new rotary mowers are now available in the Allis-Chalmers line. They are planned to maintain grassed areas along highways in addition to cutting and shredding heavy weeds and brush, and chopping brush and tree prunings.

The model 166 mower is center-mounted for the A-C D-14 tractor. It has a 5-ft. 6-in. cut. This mower has ample clearance and provides the tractor with the low center of gravity necessary for safe operation on slopes and

A-C Rotary Mower

extremely hilly terrain. Cutting height from 2 to 11 in. is hydraulically controlled from the tractor seat. Two units with 5-ft. cuts are designated as Model 160. One is a trail-type for use with any tractor or truck having PTO and standard ASAE drawbar. Remaining mower is a rear-mounted unit for quick attaching with Snap-Coupler hitch to A-C D-17, D-14, WD-45 and WD tractors.

Allis Chalmers Mfg. Company, Tractor Group, Milwaukee, Wis.

For more details circle 145 on Enclosed Return Postal Card.

Safety Shoes

A new light-weight pigskin safety shoe, which is said to save a pound or more per pair in weight over conventional safety oxfords, has been introduced by the Haus of Krause. Named the "Sportlite" model, the shoe incorporates customary steel toe protection with sport shoe styling.

Construction of this shoe has been made possible through the development of a specially designed foundation for the steel box. This foundation has a channel in which the edges of the box ride to prevent spreading under impact, and also prevent the box from cutting into the lightweight sole, the maker states. Through this development, these lightweight materials can be used in safety shoes which meet ASA specifications for toe protection against falling loads. The uppers are of brushed pigskin tanned with "Kemi-Klad" leather protector. This tannage is said to resist water, water-borne stains, acids, alkalis, perspiration stains and ordinary soil.

Sportlite Safety Shoes

Haus of Krause, Safety Shoe Division, Rockford, Mich.

For more details circle 146 on Enclosed Return Postal Card.

Welding Gun

A new manual welding gun using Air Reduction Company's gas-shielded metal-arc process has been introduced for use on mild steel.

The air-cooled gun, designated Model AH60-B, has a continuous duty rating of 600 amp DC when using "buried arc" CO_2 techniques. It can accommodate hard welding wires rang-

Aircomatic Welding Gun

ing from .035 in. through 3/32 in. fed from conventional Airco wire feeders. The gun comes equipped with a lever type trigger for simple operation and has a goose-neck nozzle assembly for ease of welding in hard-to-reach areas.

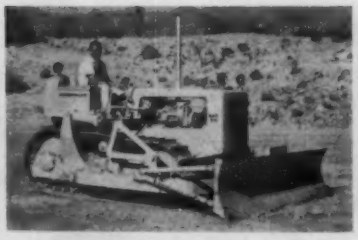
Air Reduction Sales Company, Air Reduction Company, Inc., 150 E. 42nd St., New York 17, N. Y.

For more details circle 147 on Enclosed Return Postal Card.

High Lug Capacity Tractor

A new Model D4 tractor, the Series C, has been announced by Caterpillar Tractor Company.

Available with either a standard or an optional, lower speed transmission, the unit is rated at 52 drawbar horsepower and said to have 25 percent more lugging ability than previous models. It is reportedly the first tractor of its size to incorporate the new dry type air cleaner and a forward-reverse lever. The unit is powered by a new, four-cylinder engine which delivers 65 flywheel hp at 1,600 rpm. The tractor develops 13,000 lb. maximum drawbar



New "Cat" D4 Tractor

pull in first gear with a standard transmission; with the optional transmission, there is 14,600 lb. of drawbar pull. Full shift operation without refueling is attainable due to the 42-gal. capacity fuel tank.

Caterpillar Tractor Company, Peoria, Ill.

For more details circle 148 on Enclosed Return Postal Card.

Insulating Blanket

A unique application for protecting and curing cement concrete during cold weather is the "Maka" Insulated concrete curing blanket from the Max Katz Bag Co., Inc.

A 2-in. thick layer of glass fiber is encased between sheets of heavy Visqueen 8-mil blank polyethylene film to form an insulated and curing blanket said to have unusually high insulating

"Maka" Concrete Curing Blanket

quality. The blankets are made in 6 ft. widths and up to 50 in. in length. They are said to give a cure of concrete slabs with little or no heat in below freezing temperatures. The glass fiber lining prevents transfer of heat from the wet cement concrete; the double layer of film will not stiffen or deteriorate and resists wearing, the manufacturer states.

Max Katz Bag Company, Inc., 312-16 S. New Jersey St., Indianapolis 4, Ind.

"Maka" Concrete Curing Blanket

For more details circle 149 on Enclosed Return Postal Card.

Rest Station

A new all-aluminum rest station has

Alcoa Comfort Station

been introduced by Aluminum Company of America.

Two models of the station are available; one measuring 6½ feet square, and the other 6½ by 5½ feet square. Both stand 7⅜ ft. tall with a 1 ft. pitch of the roof to the rear. Ribbed aluminum sheet is used throughout the structures for siding, roofing and doors; a coarse bark pattern is rolled into the sheet. Special fence acts as a vision barrier in front of the small station. Both models of the unit are adaptable to any type of plumbing. Daylight illumination is provided by inserts of green plastic under the eaves.

Aluminum Company of America, 720 Alcoa Bldg., Pittsburgh 19, Pa.

For more details circle 150 on Enclosed Return Postal Card.

Wheel Loader

Latest addition to the J. I. Case line of wheel loaders is the new Model W-3.

Among the outstanding features of the new 15 cu. ft. unit is a special 47 gross hp overhead-valve Case engine, which is said to provide exceptional digging power at low operating cost. Features include hydraulic torque con-

Case W-3 Wheel Loader

verter which is said to give the unit up to 56 percent more push power than conventional gear shift units. Standard rear drive tires are 14.9 x 24 6-ply with traction tread design reported to provide longer tire life. Optional equipment includes ⅜ cu. yd. dry material bucket, and a 1 cu. yd. snow bucket. Also optional and interchangeable with the loader bucket are pallet forks, log forks, a dozer blade and a crane boom.

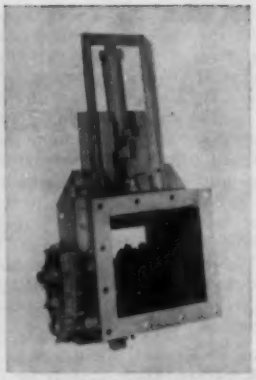
J. I. Case Company, Racine, Wis.

For more details circle 151 on Enclosed Return Postal Card.

Adaptable Feeder

The new Fair-Flo Feeder for use with batch plants is announced by Fairfield Engineering Company.

In addition to use with batch plants, the unit has industrial application for feeding cement, lime, fly ash and other pulverized materials. It features a 6 in. rotary serrated helix in the body of the feeder which is said to prevent flooding through and reduce lumps. The helix is driven by an air motor and has an infinite number of speeds. The cut-off gate is a machine fit slide plate actuated by an air cylinder. It closes in



Fair-Flo Feeder

two stages with partially closed position adjustable for accurate cut-off at a predetermined weight. The unit is available in 9 in. and 14 in. sizes. It is adaptable to Fairfield batch plants as well as others.

Fairfield Engineering Company, Marion, Ohio

For more details circle 152 on Enclosed Return Postal Card.

Grader-Applicator

This Utility Grader-Applicator manufactured by the Hester Plow Company can be handled by any tractor with three point lift.

The unit is adjustable to spread material from 0 up to 2½ in. It grades going forward, and in reverse it backgrades. The applicator will spread ma-

Hester Grader-Applicator

terial such as limerock or dolomite; Savings in material and time on asphalt application are said to be great. It is also practical, with special attachments, to spread slurry seal, the new dressing for sound but cracked roads.

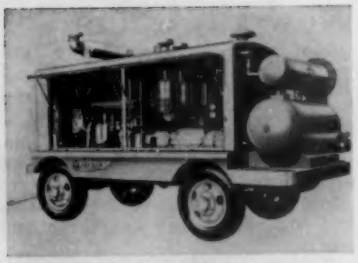
Hester Plow Company, 1721 Egner St., (P. O. Box 3655), Jacksonville 6, Fla.

For more details circle 153 on Enclosed Return Postal Card.

900 Cfm Compressor

Jaeger Machine Company has introduced a rotary air compressor which delivers 900 cfm of air at an operating speed of only 1700 rpm.

It is powered by the Model 6-110 G. M. diesel engine which generally is operated at 1800 rpm full load speed. The reduction of 100 rpm in engine speed is reported to result in a fuel factor of more than 500 cfm of delivered air per pound of fuel consumed. Close automatic regulation of engine



Jaeger Air Compressor

and compressor maintain 100 psi minimum air pressure under all normal demand. Stopping and starting require only the half-turn of a regulator crank, the manufacturer states. Standard equipment includes two-pass exhaust muffler, automatic blow-down valve, swing-type check valve, copper tube finned multi-pass oil cooler, and others.

The Jaeger Machine Company, Columbus 16, Ohio

For more details circle 154 on Enclosed Return Postal Card.

Aggregate Screen

Porta-Screen, a portable hand or motor driven aggregates tesing screen, has been announced by Gilson Screen Company.

The unit will be capable of operation free-standing on any surface, on bare ground—with spiked foot pads, or bolted to a semi-permanent location. According to preliminary specifications it will handle samples weighing up to approximately 25 lb. in sizes up to approximately 2-in. The screen has been designed for field inspection and testing, small aggregates plants, lightweight aggregates, ready-mix concrete plants, blacktop plants, for size testing of concrete products, ores and minerals, and for mass separations on research projects. The new device is said to be easily portable in two sections.

Gilson Screen Company, Malinta, Ohio

For more details circle 155 on Enclosed Return Postal Card.

1-1½ Ton Winches

Beebe Bros. Manufacturing Company has introduced new models of its ½-ton and 1-ton hand winches available with hand brakes as an optional feature. The ½-ton winches

Beebe Bros. 1-Ton Winch

come in either 3 in. or 6 in. drum widths, with or without hand brakes, and have a gear ratio of 5.3:1. 1-ton winches also offer a choice of 3 or 6 in. drum widths, with or without hand brakes, and with two speed ranges, 5.3:1 and 10.5:1. Both size winches have 2-way spring operated holding dogs.

Beebe Bros. Manufacturing Company, 2724 Sixth Ave., S., Seattle 4, Wash.

For more details circle 156 on Enclosed Return Postal Card.

Cable Dump

An increase in dumping speed and a reduction in line pull are features of the Fruehauf-Schonrock single axle cable dump, states the manufacturer. Lift arms located on the outside of the body have made it possible to increase the dump angle with a resultant decrease in line pull required to unload the trailer. The tapered front portion of the body has the advantage of pushing the load from the trailer at small dumping angles.

Fruehauf Cable Dump

This cable dump has eliminated the need for a heavy center frame through the use of pressed steel wrap-around girdles. These girdles are said to give greater strength to the trailer and permit the body shell to carry the load. It is reported that a 40,000 pound payload can be lifted with a winch using only three 10-in. sheaves, with an increase of 25% in dumping speed.

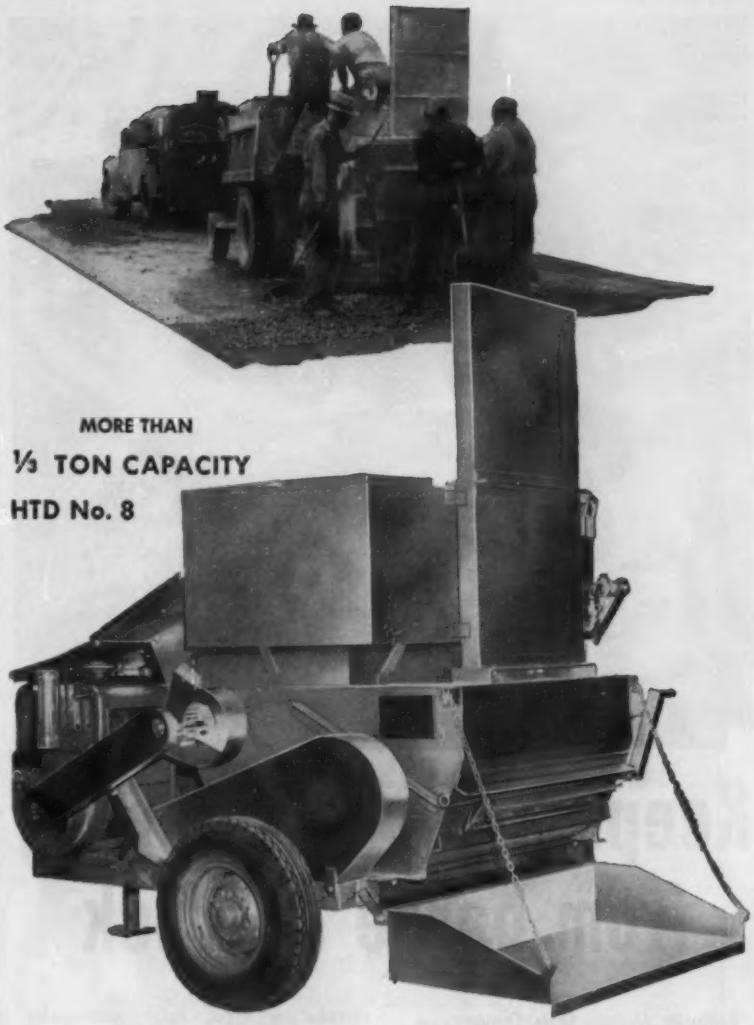
Fruehauf Trailer Company, Detroit 32, Michigan.

For more details circle 157 on Enclosed Return Postal Card.

Battery Switch

A mechanical device designed to eliminate the risk of electrical fire in any parked vehicle and to lengthen battery life, and reduce maintenance is available from the Sampson Products Company.

The "Master Switch" works on the principle of eliminating battery drain which accelerates battery deterioration and shortens battery life in vehicles. The device is designed to cut the battery loose from the wiring system of the vehicle and at the same instant ground out the ignition system, elminating the need for the ignition key. Even with a straight-wired ignition, equipment cannot be started while the switch is ac-



McConnaughay OFFERS
the most complete line of Asphalt Patching Mixers

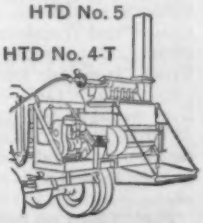
3 TO 20 TONS QUALITY HOT MIX PER HOUR

HTD No. 10

Here are the mixers you need for fast, economical pavement repairs and small surfacing jobs... in any season ...under wet or dry conditions. They are precisely engineered and rigidly constructed to handle on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt or mastic asphalt... hot or cold... at remarkably high rates. They will enable you to meet all conditions with least effort and at lowest possible costs. Write for complete specifications and proportioning tables.

HTD No. 5

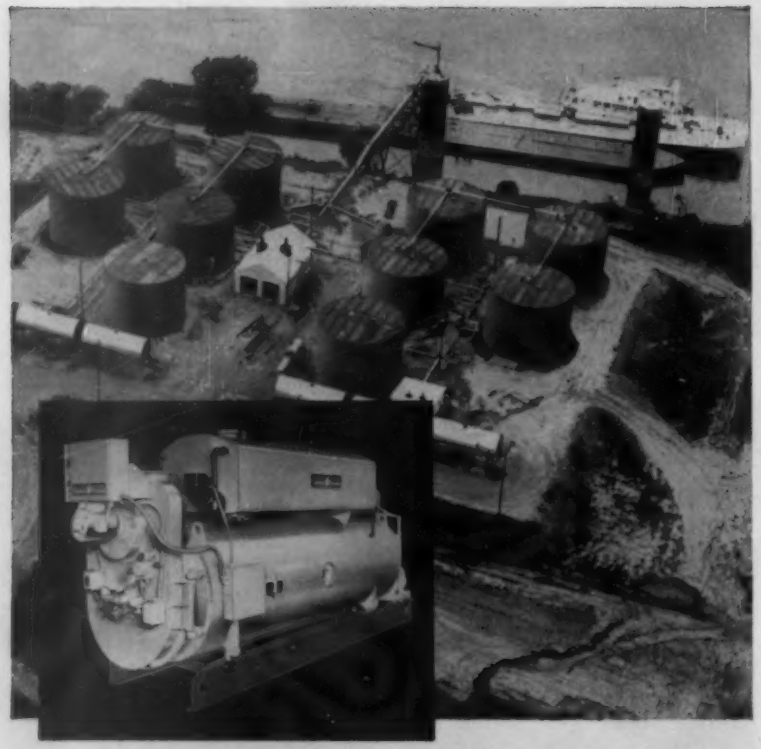
HTD No. 4-T



McCONNAUGHAY MIXERS, INC.
LAFAYETTE, INDIANA

National distributors: Asphalt Equipment Co.
3314 Cherry Lane, Fort Wayne, Indiana

... for more details circle 330 on enclosed return postal card



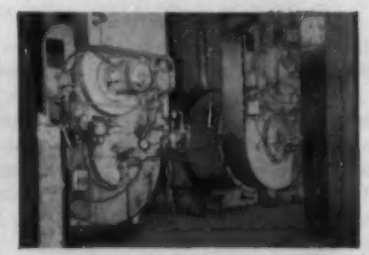
Keeping asphalt flowing from barge to truck

Kentucky Asphalt Sales Company — owner of South's largest marine terminals — expands with Cleaver-Brooks Peak-Temp oil heaters and packaged boilers — dependable heat for coordinated plant operation

Heat is *basic* to Kentucky Asphalt Sales Company's system of barge-to-truck asphalt handling. That's why Cleaver-Brooks equipment was *again* the choice for heat at their huge, new Kentuckiana (Louisville) terminal. Cleaver-Brooks heaters proved outstanding in heating over 19,000,000 gallons at Margene Terminal, Eddyville, Kentucky.

Asphalt is brought in from the refinery on barges. Dockside, it is heated and transferred via elevated, steam-jacketed pipes to storage tanks. From transfer tanks, asphalt is pumped into tank trucks which deliver asphalt, hot, to jobs within a 300-mile radius of Louisville. All the way—winter and summer—Cleaver-Brooks Peak-Temp heaters and boilers keep asphalt hot and on the move.

Peak-Temp oil heaters are forced-circulation type, fully automatic. They heat up to 450 F at low, safe pressure. Heat transfer oils they use will not freeze nor do they create pressure problems. For full information on this versatile heater and CB packaged boilers, write Cleaver-Brooks Company, Dept. P, 395 East Keefe Avenue, Milwaukee 12, Wis.



TWO PEAK-TEMP OIL HEATERS maintain pumpable temperature of 175 F in large storage tanks. Asphalt is heated to temperature as high as 325 F within transfer tanks.

Cleaver Brooks

ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

. . . for more details circle 289 on enclosed return postal card

New Products

tuated, removing the possibility of theft, the manufacturer states. A simple control located in the cab mechanically actuates the switch. Guaranteed up to 600 amperes, the switch is built of ⅛ in. cold rolled steel throughout; cadmium plated to withstand corrosion.

The Sampson Safety Products Company, Clinton, N. C.

For more details circle 158 on Enclosed Return Postal Card.

Self-Propelled Roller

A new, self-propelled, 35-ton roller with rubber tires has been announced by Shovel Supply Company.

The unit, when empty, weighs 21,700 lb. and 70,000 lb. when fully ballasted, it is provided with a General Motors 4-71 125 hp diesel. Equipped with 7, 13:00 x 24 wide-tread tires, it

Ferguson 35-ton Roller

gives full 8 ft. coverage. Instantly reversible, the unit has rolling speeds of 2, 4 and 8 mph and foot-actuated air brakes. The manufacturer states that the unit will meet all State Highway specifications and is particularly suitable for compaction of base materials and asphaltic concrete as well as being effective for the compaction of earth-fill and crushed rock.

Shovel Supply Company, Box 1369, Dallas 21, Texas.

For more details circle 159 on Enclosed Return Postal Card.

Heavy Load Chain

A new roller chain designed to handle heavy loads is available from Atlas Chain & Manufacturing Company of West Pittston, Pa., Subsidiary of Prudential Industries, Inc.

The new chain is designated the "Atlas Offset Side Bar Roller Chain." It is precision made, tough enough for use on heavy drives where the going is really severe, such as on construction machinery and quarry equipment, the manufacturer states. It is built to provide the sure action of ASA Roller Chain, plus the added clearances to resist faulty articulation caused by rust or accumulation of foreign materials. A series of identical links held together with cotter or riveted pins make up the chain. If elongation occurs during op-

eration any link can be easily removed in the shortest possible downtime.

Dept. "O" Atlas Chain & Mfg. Company, West Pittston, Pa.

For more details circle 160 on Enclosed Return Postal Card.

Air Compressor

An improved 600 cfm air compressor unit has been added to the Schramm line of Unistage Portable air compressors.

The supercharged compressor of the model 600-TC is driven by the company's version of the UDT-1091 International diesel engine. The unit is said to deliver its full 600 cfm of air at 100 psi under continuous operation at altitudes as high as 10,000 ft. Engine has

Schramm 600 cfm Air Compressor

a low operating speed of 1,200 rpm, which is said to offer long life through reduced wear. A single liquid cooling system circulates throughout the entire unit. Since the engine and compressor are connected by a hand operated clutch, this system permits both the engine and compressor to be brought up to operating temperature before being placed under load. A variety of special equipment is available.

Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.

For more details circle 161 on Enclosed Return Postal Card.

Improved Patcher

A new version of the Martin Tiltable Patcher that allows greater road clearance when retracted was recently announced by Martin Company.

Up to 8 in. clearance is possible when the highway patching unit is mounted on a 28-in. high truck frame. In normal operations, the patcher is mounted on the rear of the truck frame. It can be extended 31⅞ in. to roll 5⅞ in. below pavement level and retracted to a compact 20 in. when not in use. To match the roller angle to the slope of the road, the unit is center-pivoted to allow up to 13 deg. variation. It is said to follow the road slope regardless of position of the truck. Although the unit adds only 700 lb. to truck weight, it is possible to exert over 3½ tons pressure on the roller for patching broken pavement. Design features allow the patcher to transfer truck weight to the point of roller contact.

Martin Company, 620 Andrews Ave., Kewanee, Ill.

For more details circle 162 on Enclosed Return Postal Card.

Fork Truck

A new indoor/outdoor, 6000 lb. capacity fork truck, the "Pacer", has been announced by American Road Equipment Company. The new vehicle is available with either 10 ft. standard lifting mast or optional 7 ft. mast.

The truck is front wheel driven and engineered so that the greater the load, the greater the traction under all conditions. The largest tires of any fork truck vehicle are used—Roadbuilder 14.00 x 24:00's. The big tires add stability in carrying loads across rail tracks, timbers and rough ground. The trucks have a short wheel base and oscillating rear steering axle for high maneuverability in the cramped space of bulk materials areas. All units have power steering and torque converter for smooth handling.

American Road Equipment Company, 4201 N. 26th St., Omaha, Neb.

For more details circle 163 on Enclosed Return Postal Card.

Curb Loader

Designed to receive asphalt or non-slump concrete from a dump truck or mixer and then transport material to the curbing machine by means of a main screw conveyor is this "Curb-Loader" from Childers Manufacturing Company, Inc.

The conveyors are driven through clutches by a self-contained gasoline motor in the unit. The angle flight conveyor is adjustable up and down, will pivot 45 deg. and is removable for transporting. The wheels are adjust-

Mack

Headquarters for used trucks

Why a Used Truck from Mack?

The wide variety of Mack's nationwide stocks permits the choice of a truck which meets your specific needs. The market value of a Used Truck is often less than its true mechanical value.

Gas or diesel, cab-over or conventional, single or tandem axle, Macks or other makes—some like new, others in varying condition to fit your pocket. All priced realistically. *Upgrade your equipment now while opportunity permits.* Your present truck may make the down payment—financing on convenient terms. Insurance available. Immediate delivery. Call your Mack salesman at the nearest Mack factory branch or distributor.

MACK TRUCKS, INC.

National Used Truck Dept. • Plainfield, N. J.

PLainfield 6-8600

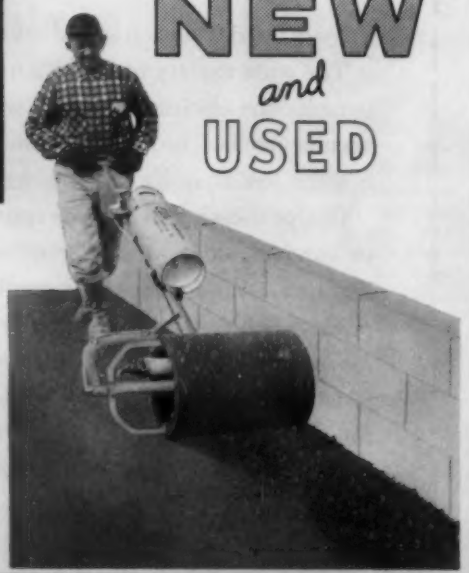
7413

FOR RENT NEW INGRAM ROLLERS

SEE YOUR DEALER OR CONTACT... Acme IRON WORKS
CULEBRA AVE. AT EXPRESSWAY N. W.
P.O. BOX 2810 • SAN ANTONIO 6, TEXAS

ELLIS

NEW and USED



FINISH THE JOB RIGHT

• COMPACTION • SMOOTHNESS
FLUSH TO FOUNDATIONS WALLS • CURBS

NO PLACE TOO SMALL

JOBS FINISHED WITH ELLIS HEATED ROLLERS GIVE YOU A BETTER REPUTATION

5 TON COMPACTION—WATER TIGHT SEAL

HEATED ASPHALT ROLLERS
ELLIS HEATED ASPHALT ROLLERS
For additional information contact:
Box 168 Liberty, Missouri

PERFECT MACHINE FOR ASPHALT FINISHING

New Products

able for two positions: one for operating (as illustrated) and the other for transporting. The unit is also said to be suitable for back filling of shoulders and median strips.

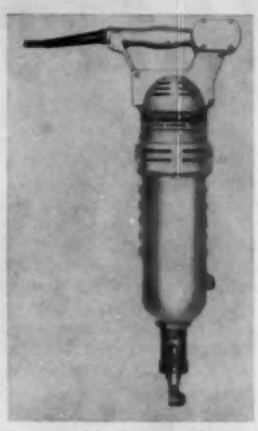
Childers Manufacturing Company, Inc., P. O. Box 618 Sta. B., Albuquerque, N. M.

For more details circle 164 on Enclosed Return Postal Card.

Electric Hammers

Three new models of electric hammers have been added to the portable electric tool line of the Porter-Cable Machine Company.

These hammers are self-contained units that operate on 110 v. current, eliminating the need for converters or rectifiers. Designed principally for concrete and brickwork, uses include chipping to remove individual bricks, roughing concrete for good bonding surfaces, tamping cinders and wet cement channeling and demolishing concrete and others. The motor is designed with a floating armature said to withstand the vibrations of the hammer's blows. Three models offer drilling ranges from 3/16 in. to 1 1/2 in., 7/16 in., to 3/4 in., and 1 in. to 3 in.



Porter-Cable Kango Hammer

Porter-Cable Machine Company, Syracuse, N. Y.

For more details circle 165 on Enclosed Return Postal Card.

ROTARY SWEEPER BROOMS

WE MANUFACTURE
• Austin-Western • Cub Low Boy • Det-Harvester • Fordson • Ferguson • Grace • Gutternipe • Hough • Huber • Jeep-Willy's
$69.50 Up
• Littlefords • Little Giants • Mell (M. B.) Blumberg • Ram • Roco • Spearswell • Tampo
Special Cores made to order

• COCOA ROLLER MATS •
Drag Broom Levelers
Street Push-Concrete Brooms
RE FILLING BUILDING PAIRS

KENNEDY'S
VAN BRUSH MFG. CO. INC
2728 McGee Trfwy. Kansas City, Mo.

DEPENDABLE USED EQUIPMENT MONEY-SAVERS

All equipment in our yard. FOB Indianapolis. Photographs available.

1—**BAY CITY** ½ Yard Crane, Model 32, 35' Boom, Waukesha Gas Engine, Independent Boom Hoist, Fairlead Long Crawlers with Page ⅜ Yard Drag Bucket, A-1 Condition $4,500.00

1—**INSLEY** ½ Yard Crane, Model K-12, 30' Boom, Buda Gas Engine, Fairlead, 24" Crawlers, A-1 Condition $4,500.00

1—**Osgood** ½ Yard Combination Crane-Shovel, Model 200, Chrysler Gas Engine, 30' Boom, Fairlead, Tagline, A-1 Condition $2,500.00

1—**WILLIAMS** ½ Yard Clam Bucket ..... $ 700.00

1—**INSLEY** ½ Yard Drag Bucket ..... $ 250.00

1—**WILLIAMS** ¾ Yard Clam Bucket ..... $ 500.00

1—**OWENS** ¾ Yard Clam Bucket ..... $ 700.00

1—**BLAW-KNOX** 2 Yard Clam Bucket $1,000.00

1—**NOVO** 3" Pump ..... $ 400.00

Items offered subject to prior sale or other disposition.

We invite your inspection. For additional information call....LIberty 7-5261

CONSTRUCTION EQUIPMENT IS OUR ONLY BUSINESS

PIT & QUARRY EQUIPMENT COMPANY

5851 East 34th Street — Indianapolis 18, Indiana

FOR SALE

Allis Chalmers Motor Grader Model AD4-3956. Has Cab w/Heater — Scarifier, Hydraulic Steering, Good Tires, 4-71 GMC Diesel. Excellent Buy at **$2850.00**

H & H EQUIPMENT COMPANY

1811 North Harwood — Dallas, Texas

FOR SALE

Complete Concrete Paving Spread. 34E Rex Paver-Spreader-Finisher.

Form, Float Subgrader, Batch Plant, Batch & Water Trucks, etc.

2—HD-21 Dozers, 1400 Hours.
2—HD-19 Dozers.
1—Cat 12 Grader, Power Steering.
1—Cat 112 Grader, Power Steering.
1—22-B Diesel, all Attachments.
1—Buda Drill Truck, mtd., disassembled.
1—10 Ton Buffalo Springfield 3 wheel Roller.
Hossfield Coal Testing Drill.
4" Water Pumps.
1—Chicago-Pneumatic Compressor, Model 210.
1—Jaeger Compressor, Model 125.
1—1950 LF Mack Tractor, Diesel.
1—10 x 16 Jaw Crusher Diamond.

SILVESTRI BROS.

713 Andrews Ave. - Phone RI 4-8638
YOUNGSTOWN 2, OHIO

NEW PILE DRIVING EQUIPMENT

3,000# DROP HAMMER
with 778⅝ Follower Block & 20' Hanging Lead
PRICE—$995.00

2,000# DROP HAMMER
with 778⅝ Follower Block & 20' Hanging Lead
PRICE—$725.00

2,000# DROP HAMMER
Guide Size, 21" x 8¼"
PRICE—$250.00

FOLLOWER BLOCKS
Guide Size, 21" x 8¼"
PRICE—$85.00

PARKER-PARKINSON, INC.
Jessup Road & U.S. 130
Thorofare, New Jersey
Tiden 5-5200

SHOVELS DRAGLINES EUCLIDS

2400 Lima 6½ yd. Shovel.
2400 Lima 6 yd. Dragline.
4500 Manitowoc 5 yd. Dragline.
54-B Bucyrus-Erie 2½ yd. Dragline.
3500 Manitowoc 2½ yd. Dragline.
80-D Northwest 2½ yd. Shovel, 1956.
1007 Osgood 2½ yd. Dragline. $12,500.
170-B Bucyrus-Erie 6½ yd. Shovel.
120-B Bucyrus-Erie 5 yd. Shovel.
4161 Marion 5 yd. Shovel.
38-B Bucyrus-Erie 1½ yd. Shovel.
36-TD Euclid 22 Ton Rear Dump.
46TD Euclids, 22 ton, rear dump.
65TD Euclids, 27 ton, rear dump.
49FD Euclids, 15 ton, rear dump.
TS-24 Euclid Motor Scrapers.
175-A Michigan Front end Loader.
38-B Bucyrus-Erie Shovel Attachment.

FRANK FAMALETTE EQUIPMENT CO.
P. O. Box 325 — Hazleton, Pa.
GL 5-4708 - GL 5-4196

NEW GM 6-71 ENGINES

GMC Diesel Twin Power Unit complete - Model 6046L - 6046E and 6046D (mixed) - Complete With All Accessories, Less Generator—

This Unit Consists of Two 6-71 GM 6 Cylinder Diesel Engines, 200 HP, 4¼" Bore, 5" Stroke - Tied Together with a Transfer Case - Each Engine Equipped with a 16 Inch Rockford Clutch - And Velvet Touch Clutch Lining Disc. Weight 5300 Lbs. Dimensions of the Cases 75 x 67 x 55. Cubic Inch Capacity 151.

Condition - New in Original Cases

Not Weathered - Not "Take Outs" - Not Rebuilt - But New New, Original Cases

Spare Parts for GMC Diesel & Gasoline Engines

S & G PARTS MANUFACTURING AND EQUIPMENT CORPORATION
62 West Street
Telephone: EVergreen 3-2600
Brooklyn 22, New York

TIRES

Clearance — Bargains

20—13:00x24	recaps	4—29.5x29	recaps
6—14:00x24	recaps	3—36.5x25	recaps
2—15:00x24	recaps	6—16:00x25	recaps
8—18:00x25	recaps	8—21:00x25	recaps
1—21:00x29	recaps	1—27:00x33	recaps

Many others—new, used and recaps. All sizes and descriptions at Bargain Prices

Contractors Headquarters for Firestone Tires

Walt Liles — Don Nelis
CAPITOL CITY TIRE COMPANY
425 N. Delaware — MElrose 4-2431
Indianapolis, Indiana

DEPENDABLE USED MACHINES

Insley X-12 dragline
Unit ½ yd. backhoe #514
8' CMETCO #202 Rola Paver
Bay City Model 25, ½ yd. hoe
Int. TD-9 tractor w/B-E dozer
#105-TMC Hopto for mounting on HD5

TRACTOR & EQUIPMENT CO.
10032 Southwest Highway, Oak Lawn, Ill.

FOR SALE
STEEL TRUSS BRIDGE

2 Main Sections @ 350 ft. each
Dual Lane, Bolted • Weight 718 Tons
SPECIAL OFFERING! American R25 REVOLVER CRANE

ALSO FOR SALE

(10) 2 c.y. Johnson Concrete Buckets
(2) 8 c.y. Garbo Concrete Buckets
(1) 4 c.y. Owens Clamshell Bucket
(1) 4½ c.y. Owens Clam. Bucket
(3) Wagon Drill/Feed—I.R.—FMC
(1) Wagon Drill—D99 Gar. Denver
(1) Sand Dryer Assembly
(1) Air Trac, Joy 400
(1) Joy Challenger 500
(3) A-C HD21 Dozers

Walsh-Perini-Morrison-Kiewit-Utah Companies

Box 106, Massena, N. Y., Rockwell 4-0515

SNOW PLOWS

For JEEPS AND TRUCKS
(1-TON MAXIMUM)

On 5-ft., 6-ft., 7-ft., 8-ft. Blades

When Inquiring include Make, Model, Year and Cylinder of Vehicle.

KENMORE WELDING CORP.

1399 Military Road — KENMORE 17, NEW YORK — BEdford 8772

FOR SALE OR RENT
NOW AVAILABLE
Good Used
Contractors Machinery

At a Substantial Saving

1—Flex Plane 20'-25' Finisher.
1—Elgin 3 c.y. Street Sweeper.
1—Northwest 25-Ton Motor Crane.
1—Lorain 25-Ton Moto Crane.
4—LeTourneau-Tourna Cranes.
2—Seeman-Andwall self-propelled Pulvi-mixers.
2—Cat Series 8T No. 12 Motorgraders.
1—Adams 512 Motorgrader.
1—Cat D8 Tractor with dozer, Serial No. 2U-13738.
1—International 1-9 rubber-tired tractor.
1—Minneapolis-Moline rubber-tired tractor.
1—LeTourneau Model M 6-yd. Scraper.
1—LeTourneau Model H Ripper.
1—Essick 54" tow-type Vibrating Roller.
1—Bros 9-wheel pneumatic roller.
1—Huber 10-12 Ton 3-wheel roller.
1—Galion 8-10 Ton 3-wheel roller.
1—Galion 10-12 Ton Diesel Tandem Roller.
1—Huber 8-10 Ton Tandem Roller.
1—Galion Model P 3-5 Ton Asphalt Roller.
1—CMC-4" Diaphragm Pump.
1—Jaeger 3" Centrifugal Pump.

MILLER C. BEASLEY MACHINERY CO.

2237 W. Northwest Hwy.
¾ Mi. W. of Circle on Grapevine Hwy.
P. O. Box 5266
Phone: FL 7-8325 Night: LA 1-0771
Dallas, Texas

RAM BLACK TOP SPREADER

with Butane Screed Heater for attachment to any Hough, Case or Michigan Machine

Used very little—
LIKE NEW

BEGANE PAVING CO.

3596 Archer Avenue
Chicago 9, Illinois
LA 3-0600

FOR SALE

One—DW21 Serial #69C1756—Used two seasons. Very good condition—Tires - Drivers 50%, Rear 90%. (Priced as is $27,500).

One—DW21 Serial #69C1764—Used two seasons. Very good condition—Tires: Drivers New 28 Ply - Rear 90% (Price as is $27,500).

One—Euc 5-18 Serial #27LDT19110—Used five seasons. Generally good condition—Recent complete engine overhaul—All hydaulic pumps re-conditioned. Tires - Drivers 85%, Rear 50% (Priced as is $19,500).

One—IV Series DW10 Tractor with 5000 Gal. Water Tank. Condition Good—Rubber Good. (Price as is $6,500).

Can all be seen, for the next 2 or 3 weeks, working on our Iowa Interstate Project near Missouri Valley, Ia.

PASCO CONSTRUCTION CO.
P. O. Box 388
Sioux Falls, S. D. — Phone 8-0551

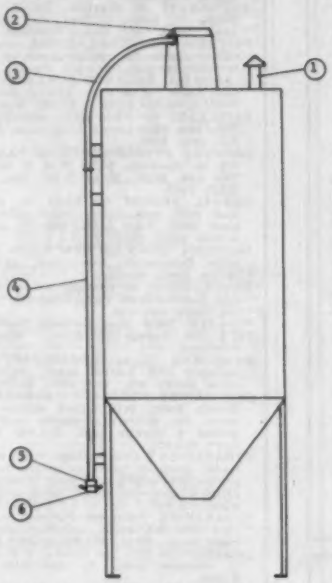
BARGAINS

3—TDT Euclid Scrapers .....$30,000.00 (For the three)
2—LeTourneau Scrapers .....$8,500.00 ea.
1—Model 1201 Lima Dragline
1—Model 80D Northwest Shovel and Drag. (New in 1957)
1—Model 80D Northwest Shovel. 1951.
1—Model 6 Northwest Shovel and Drag. New in 1956.
EUCLIDS—Rear Dump. Low hrs.
1—Model 1055 P&H Shovel—3½ yd. New 1956.
1—Model 1208 Bucyrus-Erie Shovel—3 yd.
2—FDT EUCLIDS, Bottom Dump. $6,500.00 ea.
"Other Bargains available, not listed".

WILLIAM LUBRECHT, III

Construction Equipment
311 W. Diamond Ave., Hazleton, Pa.
Gladstone 5-4041-5-0253

UNLOAD BY AIR "THE BULKO WAY" AND SAVE MONEY



HAVE THE CEMENT DELIVERED BY BULK TRAILER AND PUMPED BY AIR
We Furnish the Rest

1. Large 6" Vent to increase flow
2. Large Air Turbulence Chamber to eliminate back Pressure
3. Long Term elbow, with flanges, eliminates Air Block
4. 2 - 21' sections 4" S. tested Pipe; welded flanges
5. Male adapter inlet
6. Air tight dust proof cap

Complete with nuts and bolts, gaskets, mounting brackets and clamps, painted.
Nothing to buy, Easy to install **$395.00**

Dust collector 4" with Melch-bag shaker **$650.00**

No Moving Parts
No Wear
No Maintenance

Please Write for Full Particulars and Information

CONSTRUCTION EQUIPMENT SALES CO.

313 South Midler Ave. Syracuse 6, New York

FOR SALE

CAT. DW-21 SCRAPERS

4—each — DW-21 — Series 69C; SN'S: 1054, 1223, 1237, 1230, 1707.

2—each — DW-21 — Series 8W; SN'S: 869 and 874.

2—each — Sierra Movall Rock Wagons; SN'S: 106 and 110 Will fit all DW-20's or DW-21's.

1—each — DW-15; SN: 45C-317.

This equipment has low hours and is in excellent condition. Located in our yard and offered at bargain prices. Good financing available.

Call, wire or write:

PACE-EUCLID, INC.

3001 N. 7th St. Trfwy.
Kansas City 15, Kansas
Tele.: Finley 2-8974 - TWX: 1082

MISC. EQUIPMENT

2 FWD Salt Spreader Trucks with Snow Plows.
Marmon-Herrington Salt Spreader Truck with Plow.
Caterpillar 12 Grader, 9K Series - Power Steering.
Caterpillar 212 Grader, 1R Series.
Mandt Swing Loader.
Lorain MC-4 20-Ton Truck Crane.
Bay City 185-T66 20-Ton Truck Crane.
Jaeger 4½ Yard Mixer mounted on WC2264 White.
Williams Hole Digger Model ADH-2 Mounted on Tandem Ford.
1928 American ¾ Yard Crane - Junking for Parts.
Allis-Chalmers HD7 Dozer - Junking for Parts.
Late Model Single and Tandem Axle Dumps and Tractors.

LePine Truck Sales, Inc.
4830 Warner Rd. - Tel. Michigan 1-4260
CLEVELAND 25, OHIO

FOR SALE

1—Model 301 Koehring Shovel, ¾ yd. powered by Gen. Motors Diesel Engine (Diesel 2 yrs. old). This machine is a shovel & drag combination 50' drag boom, bucket and fairlead go with shovel. Price $4250.

1—Model 78 Northwest 2 yd. Shovel, powered by Gen. Motors Diesel Engine (Diesel) less than 2 yrs. old). Price $4500.

1—Model 25 N.W. Shovel ¾ yd. Completely Rebuilt. Tip Top Condition.

1—Chicago Pneumatic 500 CFM Portable Air Compressor driven by Cat. Diesel, mounted on rubber.

LEO A. HARDING
1625 Nay Aug. Ave., Scranton, Pa.
Phones: Diamond 4-3126 and 2-2913

ALLIS-CHALMERS MANUFACTURING COMPANY

Diesel Engines - Fork Lifts
Material Handling - Generator Sets

J. I. CASE COMPANY

Loaders - Backhoe Combinations
Crawlers - Rubber-tired Units

BAY CITY SHOVELS, INC.

Shovels - Cranes - Draglines
Truck and Crawler Mounted

BRINKER SUPPLY COMPANY

Contractors, Industrial and Mining Equipment

DOVER, OHIO	COLUMBUS, OHIO
135 W. Broadway	2158 S. High Street
Phone: 4-2333	Phone: HI 3-7671

EQUIPMENT FOR SALE

KOEHRING (1½ YD.) CRANE ONLY
(1) Model 605 with D13000 Cat Engine, 70' Boom.....$17,000
AMERICAN STEAM WHIRLEY
(1) Model 685, on a 128' x 30' Steel Barge.....$45,000
STEEL BARGE
(1) 120' x 30' 7'-6", Deck & Bottom ⅝" Plate, Sides 5/16".....$22,000
2A KOEHRING DUMPTORS
(2) Model WD60, with GM Diesel Engines.....Each $9,000
DOUBLE PUMPCRETES
(2) Model 200 Rex, Electric.....Each $8,500
BLAST HOLE DRILL
(1) Model 29T Bucyrus Erie, Electric.....$3,500
DIESEL TUNNEL LOCOMOTIVES
(2) 12-Ton Plymouth Model DMS-24, 36" ga.....Each $12,500
BATTERY LOCOMOTIVES
(2) 4-Ton Mancha Model AN, 24 ga.....Each $7,500
MUCKING MACHINES
(2) Model 40 Eimco, air operated, 36" ga.....Each $6,500
(1) Model 21 Eimco, air operated, 24" ga.....$2,500
VENTILATING FANS
(1) 60 H.P. Joy Series 1000, Axivane.....$1,500
(2) 20 H.P. Joy Series 1000, Axivane.....Each $850
DRIFTERS
(18) Model D93-15A Gardner Denver, 6' Feed.....Each $500
(6) Model SP93 Gardner Denver, 6' Feed.....Each $650
DEEPHOLE DRIFTERS
(3) Model DH143 Gardner Denver.....Each $3,000
VENTILATING PIPE
10,000—30" Spiralweld, 12 ga., 40' lengths.....$2.75/foot
AIR COMPRESSORS
(1) 3000 c.f.m. C.P. Model OCE Sta., 500 HP Syn.....$20,000
(1) 2400 c.f.m. I.R. Model PRE Sta., 400 HP Syn.....$16,500
(1) 1100 c.f.m. I.R. Model XCB Sta., 250 HP Ind.....$7,000
ALSO, a wide selection of GARDNER DENVER HYD. JIB BOOMS
WRITE FOR OUR NEW EQUIPMENT SALES BULLETIN

GUY F. ATKINSON COMPANY
10 W. Orange Ave., South San Francisco, Calif. Phone: PL 6-0300 Ext. 279.

'56 WHITE—MODEL 2864
TANDEM DUMP TRUCKS
SFDD — 50,000 Lbs. Rear Axles
Excellent condition — Good Tires

READY TO GO AND STAY GOING

12 Yd. Marion Box Side Bodies.
Main and Auxiliary Transmission.
Buy these reliable trucks for that contract.
They'll work and stay working with the best.

— BUY ONE or TEN —

SAVE over $10,000 on new truck price!
Contact "TRADER HORN" Phone: AL 4-1293

GMC USED TRUCK DEPT.
Factory Branch
General Motors Corporation
121 N. Beacon St., Brighton District - Boston, Mass.

For Sale
LOWBOYS
25 to 60 Tons 35-T Rogers
LIKE NEW
TRENCHER
Vermeer 524 T—6 mos. old
TRACTOR
Ford 6-Cylinder With Trencher & Blade
TRACTOR
IHC KB-12 w/80,000# Tulsa Winch
SANDERS, ETC.
Electric A-1
ROLLERS
Huber 3-5 Ton Kenroll — 1-3 ton
SCRAPER
8½ Yd. PTO. Demo.
JEEP TRENCHER
w/Angle Blade, New engine
KENNEDY'S
MACHINERY MART
6950 Mass. Ave. (Hwy. 100)
Indianapolis 26, Ind.
LI 5-1991

GOOD USED TRAILER TANK BARGAINS ALL SIZES & PRICES

Suitable For Water,
Fuel, and Construction Jobs

For Details
Write, Wire or Phone

THE HEIL CO.
3000 W. Montana St.
Milwaukee 1, Wisconsin
ORchard 1-3000

EUCLID 24 cy. TWIN POWER MOTOR-SCRAPER. Mdl 68FDT Tractor w/200 hp. GM diesel, 175H Scraper-Pusher w/200 hp. GM diesel, torque converter, excellent throughout. $18,500 Rental Purchase.
LORAIN TL30 MOTORCRANE 12 ton, 50' boom, jib, fairlead, excellent condition. $11,000 Yard. Rental Purchase.
NORTHWEST 25 Dragline, #6742, w/371 GM diesel, 45' boom, fairlead, very good appearance. $4500 Yard. Rental Purchase.
P&H 255A Crane-Shovel, #13585, new 1953, excellent appearance. $4500 choice of attachment or $5500 for both. 371 GM diesel.
CLAMSHELL BUCKETS & DRAGLINE Booms, new Hains 1½ & 2 cy. general purpose clamshells w/teeth. $1450 & $1800. New.
FAIRLEADS for P&H 255A, new, $350 Bucyrus 22B, new $250 Lorain L82B, new, $600. P&H 655, new, $400.
BACKHOE ATTACHMENTS for P&H 655, new 1½ cy. complete. $4750 P & H Mighty Mite, like new, $900. Orton 2 cy. new. At others, $2500 Yard.
SHOVEL FRONTS for Lima 34, new, $1100. Unit 1020, new, $1350. P&H 255A, complete, good, $950. P&H 655B, new 1½ cy. complete w/dock parts. $4750 Yard.
INGERSOL RAND 600 CFM Rotary Diesel Portable Compressor, overhauled. $7,500. Rent $750/mo. apply purchase.
DAVEY 210 CFM Portable Diesel Compressor, late model "Super Chief," rebuilt. Rent $200/mo. apply purchase.
PIONEER 300W Semi-Portable Washing Plant. 900 S. 10th, Kansas City, Kans. Mayfair 1-1710 Purchase.
SAUERMAN 1½ cy. DRAGSCRAPER OUTFIT complete with 3-drum winch, masts, buckets, cable, blocks, etc. Very good. $6,500.
CEDARAPIDS PORTABLE CRUSHERS, w/1024 Double Rolls, 3x10 2-deck screens, rotovator, power, two delivery conveyors, tandem rubber, unused & slightly used. $10,500 Yard. Cost Gov't. $24,000.
CEDARAPIDS 2-Unit Portable Plant w/1824 Jaw, feeder, conveyor, power on tandem rubber. Secondary 1024 rolls, 3x8 2-deck screen, rotovator, delivery conveyors, power, tandem rubber. Unused.
CEDARAPIDS Pitmaster Portable w/1016 Jaw, 1016 roll, 3x8 screen, rotovator, power, pneumatic tires. Good. $11,500 Rental Purchase.
CEDARAPIDS 2225 Jaw Crusher w/8' apron feeder, conveyor, power, on steel skids, excellent. $7,500.
GRUENDLER 2430 Jaw Crusher w/14' apron feeder, conveyor, power, on steel skids, excellent. $15,000. Terms.
CEDARAPIDS 2036 Jaw Portable Primary w/8' feeder, 30x36 conveyor, diesel power, tandem rubber, excellent. $17,500 Yard. Rental Purchase.

WENZEL MACHINERY CO.
905 S. 10th, Kansas City, Kans. Mayfair 1-1710

---

25 TON TANDEM MACHINERY TRAILER

Air Brakes—ICC LIGHTING—
Walking Beam Type Tandem
16 Ft. Loading Deck
8 Ft. Wide.

$3,040

F.O.B. Statesboro, Ga.
+ Sales Tax

Equipped With Budd 10-hole lug Wheels, 8.25 x 20 x 12 ply tires
15-inch wheels also available. 30-inch Loading Tail

GALAN TRAILER CO.
Phone POplar 4-9284
P. O. Box 266 - Statesboro, Georgia

3—10' x 28' Dryers—6854 Jaw Crusher
60" Merrick Weightometer—30" B.A.
Feeder 160' Long, 40" x 120' Feeder
Conveyor-Symtron Screen Cone, 24" x 21'
Symtron F30 Feeder—6' x 14' Vibrating feeders
30" x 200' & 150' Conv. 9030
Dixie Nonslag Moving plate Hammermills
Asphalt Plants-Hydrated Lime Plant.
3'3'4' Symons & Telsmith Cones, 66FC
Tel. Cone Part. 24" x 25' Engine—opt.
Fine Screens, others. Jaw-Cones-Gyratory-Rolls dbl. Triple-Hammermills & Impactor crushers. Ball-Rod-Tube-Mills-Screening-Washing & Crushing Plants.
Classifiers-Compressors-Conveyors, Cranes-Drills-Dump Cars-Dredges-Feeders-Hoists-Motors-Generators-Kilns-Dryers-Locomotives-Pumps-Screens-Shovels-Draglines-Transformers-Euclid Trucks.

Equipment List sent on request.

Stanley B. Troyer Equipment Company
Box 97 Phone 580 Crosby, Minnesota

ASPHALT PLANT:

BARBER-GREENE 894 - 4000# Batch-O-Matic - BARBER-GREENE Model 837 Dryer - BARBER-GREENE Model 881 Cold Elevator - BARBER-GREENE Model 857 Portable Dust Collector - BARBER GREENE Model 815 Cold Aggregate Feeder - Hot Elevator and Material Elevators - 4 10,000 GALLON ASPHALT STORAGE TANKS - 1 Model 55 HY-WAY Hot Oil Heater - All in good condition - Has produced only 150,000 tons.
PRICE $65,000.00

AS IS - WHERE IS

ROLLERS:

AUSTIN-WESTERN 8 to 12 Ton Tandem, GMC-271 Engine, Torque Converter, and 4-Speed Transmission, used only 2 months $7,500.00

GALION Model R Tandem 8 to 10 Ton - With International Diesel Engine..$3,500.00

FERGUSON 5 to 8 Ton Tandem, with Chrysler Industrial Engine $4,000.00

GALION Trench Roller - New Condition. $4,000.00

DISTRIBUTORS:

ROSCOE 1250 Gallon, 20 Ft. Circulating Bar mounted on International Truck. Clean and Good $4,500.00

MUD-JACK:

KOEHRING Model 50-2A on 4-steel wheels. Buda HP - 217 Engine - used very little $2,250.00

TRUCK CRANE AND BACKHOE COMBINATION:

Quickway Model "E" - 35 ft. boom and fairlead. Powered by IHC UD-9 Diesel mounted on International Crane Carrier. Backhoe ½ cubic yard capacity. Looks good - Runs good $9,500.00

Hawkins Equipment Co.
1475 Thomas St. - P. O. Box 4695
MEMPHIS 7, TENNESSEE

We do a Nation-Wide business in

STEEL SHEET PILING

FOR SALE OR RENT

80 pcs.	48 ft.	Z-32	Missouri
215 pcs.	60 ft.	MP-116	Illinois
100 pcs.	80-90 ft.	MP-115	Tennessee
210 pcs.	80-90 ft.	DP-2	New York
682 pcs.	45 ft.	MP-101	Indiana
473 pcs.	30 ft.	AP-3	Maryland
100 pcs.	25 ft.	DP-2	Penna.
280 pcs.	20 ft.	MP-112	Kansas

Storage yards at Buffalo - Baltimore - New Orleans - Memphis - Chicago
Also - H Bearing Pile

McKiernan - Terry and Vulcan Pile Hammers and Extractors - Construction and Railroad Equipment.

We are as close as your telephone—you can obtain Steel Sheet PILING BY DIALING CHestnut 1-4474, St. Louis, Mo. COLLECT

MISSISSIPPI VALLEY EQUIPMENT CO.
1906 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

SAVE 40% TO 60% ON

ATTACHMENTS

WORLD'S LARGEST SELECTION

CHECK UDELSON FIRST!

Cranes
Shovels
Dozers
Scrapers

New - Used, Excellent Condition - Available Now

BACKHOES

Bucyrus-Erie, 15-B, Complete, New.
Bucyrus-Erie, 22-B, ¾ yd. Good.
Marion 372, New.
Osgood 200, ½ yard, complete. New.
P&H 255A, ¾ yard. New. Chain Crowd, Straight Type.
P&H 255A, ¾ yard. New Camel Back.
P&H 855, BLC Camel Back, 2 yard. New.
NW-18, ½ yard. Good.
Lorain 40 or 41, ¾. Excellent.
American 375-B, ¾ Camel Back. New.
Bucyrus-Erie 51-B, 2 yard. Will adapt to other new 2 yard machines.
Link-Belt LS85. New.
Lorain 820 Camel Back, complete.

CRANE BOOMS

Bucyrus-Erie 15B - 30'; New.
Bucyrus-Erie 22B - 35'.
Bucyrus-Erie 22B, 20' Sections - New.
Koehring 205, ½ yard. New.
Lima 1201 - 15'; Jib & Mast. New.
Lima 604 Jib, 10'. New.
Link-Belt K-370, 70'. Excellent.
Lorain 41, 25'. New.
Lorain 80, 82, 820, new.
NW-18, 25'. New.
Osgood 200, 25'. New.
Manitowoc 2000-B, 45 foot, new, 3000-B, 15' Jib, complete. New.
Lima 604-750. Good.
NW-6, 1½ yard. New.
Schield-Bantam A851.
Fits other ¾ yd. machines.
Link-Belt HC 70, 35' boom. NEW.
Marion 372 - 15' Jib; New.
Marion 352, 1¼ yd., 40' boom. NEW.
P&H 150 - 30'. New.
P&H 655 - 50'. New.
P&H 655, 20' Jib. NEW.
American 375 BC, 35', like new. Priced to sell.
P&H 255ATC, 80' complete w/harness and hogline. NEW.
Unit 1020 - Harness & Heglines. New.

SHOVEL FRONTS

Bay City 37, ¾ yd. Good.
Bay City 65, less bucket. Good.
Bucyrus-Erie 10-B, ⅜ yd. New.
Bucyrus-Erie 15-B, New.
Bucyrus-Erie 22-B, ¾ yd. New.
Bucyrus-Erie 37-B, 1½ yd. Good.
Bay City 20, ⅜ yd. Good.
Buckeye 70 and GarWood 20A. New.
GarWood 75-B ¾ yd. New.
Koehring 701, 2-yd. New.
Koehring 304 with chain, like new.
Lima 604, 1½ yd. Good.
Lima 34, ¾ yd. New.
Lorain, TL-25 - New.
Lorain 820, 2½ yd. Complete.
Lorain 40, ¾ yd. Complete. New.
Lorain 50, Complete, Excellent Condition.
Link-Belt LS-75. Good.
Manitowoc 2000B - New.
Marion 372, 1¾ yd. Good.
Insley K-12, ½ yd. New.
Osgood 200. Complete, NEW.

BOOM SECTIONS

In Various Lengths - Inquire

Bay City 180M.
Bucyrus-Erie 15B, 22B, 37B, 44B.
Buckeye 70.
Browning T15C.
Garwood M20A, M20B.
Koehring 304, 304TC.
Lima 603, 604, 802.
Link-Belt LS-75, LS-85, LS-90.
Link-Belt K-360, K-370.
Lorain TL25, 80, 820.
Manitowoc 2000B, 3000B.
Marion 362, 372.
Michigan - All Models.
Northwest 25, 71, 8.
Unit 1020.
Wayne 40.
P&H all models.
N.W. 25, 6, 71, 8.

NEW FAIRLEADS AVAILABLE

American 375B; Bay City 45, 65; Bucyrus-Erie 15B and 22B and 44B; GarWood 75B, M20A; General 307; Lima 604; Link-Belt K-360 or K-370; Lorain MC4, MC414, 416, L-40 or 41; Lorain 80, 82, 820, 85 - Marion 342, 362-372-40A - Northwest 6 - Osgood 50, 200 - Orton 22G; P&H 655A, 855B, Byers 83, unit 1020.

New Bucyrus-Erie 15B, 20B and 22B. Special.....$275.00
Koehring 304, Revolving Type. Special - New.....

WRITE — WIRE — PHONE — NEW ATTACHMENTS ALWAYS COMING IN

"We Own What We Offer"

UDELSON EQUIPMENT COMPANY

3210 WOODLAND AVENUE - CLEVELAND 15, OHIO
P. O. Box 5191 - Call SUperior 1-1666

FOR SALE

1—Koehring 34E Dual Drum Paver, SN 27332, with 4 Cyl. Model 4057-C GM Diesel Engine, SN 4A-57145. Used only parts of 3 seasons. In good condition. Located in Iowa.

1—Koehring 34E Dual Drum Paver, SN 25478, with 4 Cyl. Model 4057-C GM Diesel Engine. This paver has had only standby use last three seasons. Paver is in good working condition. Located in Iowa.

Fred Carlson Co., Inc.
Box 35, Decorah, Iowa

FOR SALE

ERECT CRANES - DRAGLINES
SHOVELS - BACKHOES

LATE MODELS - EXCELLENT CONDITION
Manitowoc 2000B, 3000B, 3500, 3900 and 4500
Northwest 25, 6, 80-D and 95 Models.
Bucyrus-Erie 22-B, 51-B, 54-B.
Marion, Koehring, Link-Belt, Lorain, Lima & P&H long booms, wide long crawlers, diesel powered. 16 equivalent sizes available.

JAMES C. FRENCH
SPECIALIZING ON:
Cranes - Drag - Clams - Shovels - Backhoes
P. O. Box 188 - 226 Barry Pkwy.
Park Ridge, Illinois - TAlcott 3-4927

NEED EQUIPMENT?

"WE HAVE IT"

USED CONSTRUCTION EQUIPMENT

ALL MAKES AND TYPES

WESTPORT MACHINERY CO.

1801 Cherry Hill Road **Baltimore 30, Md.**

Phone: MUlberry 5-0402

W. F. Rippel, President — Home Phone HO 7-9931

RECONDITIONED ELECTRIC MOTORS

Sold With New Equipment Warranty

QTY.	MAKE	HP	FRAME	RPM	TYPE	ENCL	VOLTS	PRICE	
1	G.E.	40	404	1765	K	DP	220/440	$280	
1	LOUIS ALLIS	30	444	1175	FA	SP	220/440	340	
1	WESTINGHOUSE	30	405	1175	CSP	SP	220/440	340	
2	G.E.	25	405	1170	KG	SP	220/440	295	
3	G.E.	20	405	865	KG	SP	220/440	296	
1	G.E.	10	324	1740	K	DP	220/440	123	
1	WAGNER	5	254	1750	EPI	TEFC	220/440	89	
1	WESTINGHOUSE	5	284	1750	CS	TEFC	220/440	80	(1" Shaft)
1	G.E.	3	254	1155	K	TEFC	220/440	89	
1	WESTINGHOUSE	3	254	1160	CS	TEFC	220/440	80	(1" Shaft)
1	HOWELL	3	254	1160	SC	DP	220/440	130	(W Brake)
1	STERLING	3	254	1200	KF	DP	220/440	70	(Shaft Short)
1	G.E.	3	254	1145	K	DP	220/440	78	
				SINGLE PHASE					
1	MARATHON	5	325X	1725	SR	DP	115/230	$145	
1	ROBBINS & MYERS	3	254	1140	KLG	DP	115/230	190	
1	WAGNER	5	254	1730	RA	DP	115/230	190	

ELECTRIC TOOLS

1 SKILL 3/8" HEAVY DUTY DRILL, 115 Volts AC DC ..... $ 75
1 STANLEY 7" Belt Sander 60
1 WIZZARD 6 1/4" Portable Hand Saw 40

INDUSTRIAL ELECTRIC COMPANY

Box 656 - El Dorado Hwy. - Magnolia, Arkansas

CONTRACTORS TRUCK SPECIALS

54 INTL RF-195 TANDEM 450 Eng-2-way AUX. TRANS. NEW PAINT — ROAD READY

REDUCED TO $4,000

SEVERAL 58 INTL A-162 2 ton-4 yard capacity HEIL DUMP 2 speed axles HD FRAME, SPRINGS, BRAKES, RADIATOR

$1750 to $1995

53 Dia T TANDEM 10 yard DUMP BODY. Good Engine - 3 way Aux.

REDUCED TO $1650.00

58 INTL 2 SEATED PICKUP CARRIES 6 MEN & ½ ton load on 6 foot PICKUP BODY. USED AS A DEMONSTRATOR ONLY.

PRICE CUT TO $1900

56 FORD F-900 5 Spd TRANS 3 WAY AUX ROAD READY. GOOD TIRES.

ONLY $2250

INTERNATIONAL HARVESTER CO.

910 EAST 6th — FR 4-6474

LITTLE ROCK, ARKANSAS

FOR SALE

MICHIGAN MODEL 175A

2¾ Yard Tractor Shovel, S/N 18850DW, 18:00x25, 12 ply rubber with one spare, recently rebuilt, excellent condition. $15,500.00 F.O.B. Powers, Michigan.

OLIVER OC-12 LOADER

1½ yard capacity, diesel Crawler Demonstrator with a new machine guarantee. A bargain at $7900.00 F.O.B. Powers, Michigan.

TWO OLIVER MODEL 990

8-Yard Scrapers, powered with GMC Diesel. Demonstrators, excellent condition, sacrifice at $10,900.00 ea. F.O.B. Powers, Michigan.

Wis. Industrial Truck Co.

Powers, Mich. - Ph. HX 7-5296

H & G STEEL SHEET PILING

STOCKS TORONTO, BUFFALO, BOSTON, BALTIMORE, NEW YORK, JACKSONVILLE, NEW ORLEANS, MIAMI

520 Pos. BP-13—BP-10—53' to 09'
380 Pos. ZP-38—25, 38, 50, 55', 60'
870 Pos. ZP-27—ZP-32—20', 25' 40' & 60'
900 Pos. DP-3—45', 60' 40', 40' & 30'
1700 Pos. SP-4—60', 55', 45' & 40'
1200 Pos. SP-6A—50', 45', 40' & 20'
980 Pos. AP-3—60', 30', 25' & 20'

DIESEL LOCOMOTIVES

16 Gen. Elec. 100, 80, 65, 45, 25 & 20 Ton
4 Whitcomb 8 ton & 15 ton
1 Brownhoist 60' Boom, Cat. Diesel

R. C. STANHOPE, INC.

Telephone MU. 2-5075

60 E. 42 St. New York 17, N. Y.

FOR SALE

WHITE HALF TRACKS

Gov't Processed - Like New
Ideal for Crane Mounting

REO EAGER BEAVER

With Or Without Dump Bed, 900-20 M & S Tires, Closed Cab.
- Excellent Condition.

MYERS EQUIPMENT CO.

835 Crump Blvd. - Phone JA 5-3213

MEMPHIS, TENNESSEE

FOR SALE

Lorain MC42SW 25 Ton Moto Crane, 60' Tubular Boom, Automatic Folding Gantry, Outriggers, Aluminum Floats and Screws, New 1956, 3900 Miles on Carrier, Waukeshaw Gas Engines in Crane & Carrier, Excellent Condition Throughout.

AL. FISHEL EQUIPMENT SALES CO.
1318 No. Vandeventer Ave. - Ph. JE 5-4482
St. Louis 13, Mo.

WANTED PORTABLE TRUCK SCALE

10' Wide, 40' Long, 40 ton Capacity

Please state price, age, condition, make, and model.

Box 1228, Roads & Streets,
22 W. Maple St., Chicago 10, Ill.

50,000 FEET

6" Line Pipe

6⅝" OD, 11.88#, 50 ft. pieces. Clean and straight-torched ends or beveled for welding as required. A close out. Write or phone for bargains on this material while it lasts. Ready for shipment and inspection - our yards - Mt. Pleasant, Michigan.

Evaluation & Sales Service

P.O. Box 416 - Mt. Pleasant, Mich.
Phones: SP 3-3981 & 8-3551

TRUCK SALE

ALL TRUCKS RECONDITIONED & GUARANTEED
PRICES GOOD ONLY THRU FEBRUARY
QUANTITIES LIMITED!

DODGE ¾ ton 4x4 Late Model M-37 with pick-up type bed. $950.00

FEDERAL MODEL 604 10-ton 6x4 tandem truck, Rebuilt Cummin diesel engine, 167" wheelbase, winch. Regular $4450.00 .....$3750.00

STERLING 12-ton 6x6, cab & chassis, 462 tandem rear end, rebuilt Waukesha engine. Regular $3750.00 .....$2950.00

REO 2½ ton 6x6 Line Maintenance truck, front & rear winches, Gold Comet engine, Regular $4750.00 ....$3450.00

GMC 2½ ton 6x6 Cab & Chassis. Regular $1750.00 ....$1395.00

FORD F-6 w/Challenge 3-yard Mixer. Regular $1950.00. .....$1150.00

FORD F-8 w/Rex 3½-yard Mixers. Regular $2500.00.....1450.00

HERCULES HXD engines — Remanufactured $395.00

TRAILMOBILE C-2 tandem semi-lowbed trailers. Excellent Condition:

or F.O.B. Oklahoma City
F.O.B. San Antonio, Tex.
$2500.00

BRAUBACH EQUIPMENT COMPANY

Box 4542
1620 W. Poplar San Antonio, Tex.
PE 6-1659

PORTABLE PIPING
For Rent or Sale

ALCOA ALUMINUM
with McDowell or Victaulic couplings, quick acting, positive, easy to handle and relay. For temporary water supply or drainage.

GALVANIZED STEEL
with fast line industrial couplings. 600 lbs. working pressure for steam or compressed air.

OLDFIELD EQUIPMENT CO.
430 W. Seymour VA 1-5582
CINCINNATI 16, OHIO

Kolman Portable Conveyor Loads a Scraper a Minute

A tractor pulls the Kolman 101 free as the crew prepares to move from one pit to another. The unit is designed for ease of movement. Note how the single-deck screen folds under for transporation.

Model 101 Speeds Movement of Borrow for Railroad Relocation in Washington Dam Project

Rigid sanitary, turbidity and time requirements did not prevent contractors from completing work on schedule for the relocating of 14 miles of Northern Pacific main line in preliminary work on the Howard A. Hanson Dam flood-control project on the Green River in western Washington.

Part of the credit goes to the hard-working Kolman Model 101 Conveyor-Screen plant. The Kolman conveyor was operated in a series of pits moving large quantities of borrow.

In the pits, as many as five Cat DS dozers brought material to a slot where a D9 with a U-dozer fed the conveyor dozer trap. A fleet of rubber-tired scrapers, which were loaded at a rate of one per minute, hauled the material to the big fills, some as high as 110 feet.

In a later stage, the conveyor was fitted with a 10-inch grizzly and a 9'x54" vibrating screen with 3"-square openings to produce subballast for the track.

Kolman offers a choice of single, double or triple-deck screens up to 5'x12' on the Model 101. Belt widths of 18" to 48" in lengths up to 60 feet.

Write for Literature and Prices

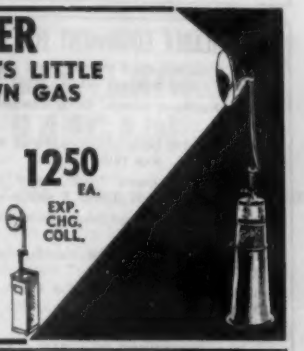
KOLMAN MANUFACTURING CO.
5200 West 12th St. Sioux Falls, S. D.

8000 CANDLEPOWER
CARBIDE FLOOD LIGHTS • COSTS LITTLE TO OPERATE • GENERATES OWN GAS

Portable Illumination—Where and When You Need It
• MARINAS • AIRFIELDS • BALLFIELDS
• RESCUE WORK • SALVAGE WORK
Operates in hot, also freezing weather, rain, sleet, hail, wind. 13" dia. reflector—sturdy welded const. Heavily galvanized. Free of smoke and sparks. 2 designs to choose from.

Carbic Floodlight Round Tank. 100 lb. drum #20 carbic cake contains 40 cakes—cost $9.10 cwt. 1 cake with water keeps light burning approx. 3 hours. Milburn Floodlight Square Tank. 4 carbic cakes with water will burn approx. 12 hours — $9.10 cwt. Carbic cakes can be purchased locally.

12.50 EA. EXP. CHG. COLL.



J. JACOB SHANNON
218 N. 22nd St., Philadelphia 3, Pa.
Expressway to 23r St. Exit Direct—No City Traffic

TANDEM TRUCKS
GMC's

'57 - '58 MODELS W503 MAY BE USED FOR TRACTORS OR DUMP BODIES

These Units Have Been Completely Reconditioned and Are Priced To Sell!

CALL OR WRITE:

GENERAL TRUCK SALES, INC.
535 Murfreesboro Rd.,
Nashville, Tenn.
Phone: CHapel 25521

NEW LINE PIPE
(Limited Service)

11,000' 12¾" O.D. .250 Wall 33.23#
3,000' 16" O.D. .312 Wall 52.35#

All Electricweld, Mill Tested, app. 40' DRL, beveled. Priced attractively for prompt shipment. Detroit, Michigan.

MID-STATES PIPE AND SUPPLY CO.
P. O. Box 2534 Tulsa 1, Oklahoma
Phone LU 2-9128

ATTACHMENTS AVAILABLE
Northwest - Bucyrus-Erie - Lima - Marion
Link Belt - Lorain - P&H - Manitowoc
Shovels - Backhoe - Clam Drag - all sizes.

JAMES C. FRENCH
P. O. Box 183
226 Berry Pwy. Talcott 9-4927
PARK RIDGE, ILLINOIS

STEEL STORAGE TANKS

Originally Tank-Car Tanks . . . Recently removed from service

8,000 and 10,000 GALLON CAPACITY

(Riveted Construction)

Ideal for Molasses, Asphalt, Liquid Fertilizer and many other fluids.
Weight approximately 14,000 and 16,000 lbs. ea.

OFFERED AT SPECIAL LOW PRICES

Complete inventory Structural steel, Beams, Channels, Angles, Bars, Plates, Reinforcing Bars, Wire Mesh and Steel Pipe, black and galvanized, ⅛" through 30".

write, wire or phone for complete information

BROWN - STRAUSS CORPORATION

1546 Guinotte — Phone HA 1-1000 — Kansas City, Mo.

TURBINES WITH GENERATORS FOR SALE

Unit 1—STEAM TURBINE, 3600 rpm. 200# Pressure, 438 hp, with GENERATOR, with EXCITER E-3039.
GENERATOR—ALLIS-CHALMERS 300 KW, 2300 Volts, 94 Amps, 60 Cycles, 3 Phase, 3600 rpm, with Exciter E-3039 with 621 TURBINE.
EXCITER—ALLIS-CHALMERS 125 Volts, 3600 rpm. 52 Amp. Frequency Changer, with E-3038 Generator, with 621 Steam Turbine.

Unit 2—KERR TURBINE rated KKW 1000, 3600 rpm, driving GENERATOR E-3035, attached to Frequency Changer E-3037.
GENERATOR—ALLIS-CHALMERS, 3 Phase, 60 Cycles, 3600 hpm. Generator on Steam Turbine #620.
EXCITER—ALLIS-CHALMERS 125 Volts, 88 Amps, 3600 rmp, Frequency Changer, attached to Steam Turbine #620, attached to Generator E-3035.

NO REASONABLE OFFER REFUSED

JACK HARRISON SALVAGE CO.

Phones: FL 2-2266, FL 3-5416 - Jackson, Mississippi - P. O. Box 2107

AVAILABLE EQUIPMENT FOR SALE

2—3400 Lima Shovels, 2 Highlift fronts, 1 standard front. Serial Numbers 324910, 32332.

2—88-D Northwest Shovels, Serial Numbers 12774, 13188.

2—TS-24 Euclid Motor Scrapers Serial Numbers 28839, 28848. New 1958.

4—Model 85 TD Euclid Trucks, Serial Numbers 27876, 27877, 27878, 27879. 4 months old.

4—International 98 Payhaulers, Serial Numbers 677, 687, 695, 697.

10—Model 2FD, 5FD, 27FD Euclids, Fair condition.

8—D-8 Tractors, #25 C.C.U., 8-A Blades, Serial Numbers 2U6233, 8162, 9720, 13845, 17002, 19142.

ALL EQUIPMENT IN FIRST CLASS OPERATING CONDITION

CENTRAL PENNSYLVANIA QUARRY, STRIPPING & CONSTRUCTION CO.

276 South Pine St., Hazleton, Penna.
Phone: GLadstone 4-3551

NEW 16" O.D. PIPE

4,600 ft. 16" O.D., .188 Wall, 31.66# Armco Spiralweld Steel Pipe, Manufactured to ASTM specification A-139, Grade B, lined, coated and wrapped in accordance with AWWA C-203 specifications, 50 ft. lengths with ends prepared for Dresser couplings.

Priced Attractively for Quick Sale from Tulsa, Oklahoma

MID-STATES PIPE AND MACHINERY CO.

P.O. Box 2534 — Phone LU 2-9128
Tulsa 1, Oklahoma

HEAVY EXCAVATION EQUIPMENT DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

2400 Lima Elec. Drag. 130', 6 yd.
2400 Lima Diesel Drag. 130', 6 yd.
4500 Manitowoc Drag. 120', 8 yd.
120-B B.E. Elec. Drag. 110', 8 yd.
88-B B.E. Drag. 90', 4½ yd.
111-M Marion Drag. 100', 4 yd.
1501 Lima 4 yd. Shovel/Drag.
1055 P&H Drag. 80', 3½ yd.
1201 Lima Drag. 85', 3 yd.
3500 Manitowoc Drag. 85', 2½ yd.
54-B B.E. Drag. 80', 2½ yd.
1001 Lima Dragline, 85' 2½ yd.
95 Northwest Dragline, 90', 2½ yd.
151-M Marion 7 yd. Elec Shovel
170-B B.E. 6½ yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
2400 Lima 5½ yd. Standard Shovel
120-B B.E. 4 yd. Elec. Shovel
111-M Marion 4 yd. Standard Shovel
1201 Lima 3½ yd. Standard Shovel
88-D Northwest 2½ yd. Standard Shovel
54-B B.E. 2½ yd. Standard Shovel
3500 Manitowoc 2 yd. Standard Shovel
25 Northwest ⅝ yd. Backhoe
22-B B.E. ¾ yd. Backhoe
34 Lima ¾ yd. Shovel
Unit 1838 ½ yd. Shovel
Model T-450 REICHdrill Truck Mtd. Rotary and Down-The-Hole
Ingersoll-Rand Truck Mtd. & Crawler Mtd. Drill-masters
Joy Truck Mtd. Rotary Air Drill. 6" holes
Euclid Trucks, Rear & Bottom Dump
Truck Cranes, Dozers, Graders, Scrapers, Attachments

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton National Bank Bldg.
GLadstone 5-3638
HAZLETON, PA.

FOR SALE

Universal Wobbler Feeder, 60" Wide, 13 Bar, 12½" Pitch, Complete with Drives, Electric Powered, Lubrication System, Variable Speed Transmission, Good Condition, Original Cost over $50,000.00 Will Take $15,000.00 F.O.B. Location near Chicago, Illinois.

AL. FISHEL EQUIPMENT SALES CO.

1318 No. Vandeventer Ave. - Ph. JE 5-4482
St. Louis 13, Mo.

MATERIAL FOR SALE

One (1) Cubic Yard Sauerman Truck Cable Scraper Machine complete, P.S.E. 2140 - Two (2) Drum Roller Bearing Scraper Hoist, having 350 feet per minute front drum, 700 feet per minute rear drum, powered by 100 H.P., 3 phase, 60 cycle, 440 volt wound rotor motor with variable speed controls. 2 Cubic yard heavy type Crescent Bucket complete with C 2062 3 wheel block roller bearing carrier and shifting type anchor. Also 50 feet Tubular Mast with ladder and platform, mast bands, pins, guy cables, blocks and fittings included.

One (1) #5 Sand Drag - 54" wide with 600 gallon per minute maximum water capacity complete with 10 H.P. Allis-Chalmers 220/-440 volts, 60 cycle, 3 phase motors and 20 R.P.M. #1017-EF speed reducer.

One (1) Allen Bradley Model 798 Multi-unit control panel center with "Start-Stop" and reset button, pilot light signal on each, ten (10) switches - (1 - 3 H.P., 3 - 5 H.P., 4 - 10 H.P., 1 - 20 H.P., and 1 - 100 H.P.) complete with 7½ K.V.A. Transformer 110/220 Volt Single Phase from 440 Volt 3 Phase.

WYANDOT DOLOMITE, INC.

CAREY, OHIO

Office Phone - EXpert 6-2711 - Carey, Ohio
Evenings - AXminister 4-2081 - Upper Sandusky, Ohio.

FOR SALE

Galion 118 Diesel Motor Grader

S/N GMD 21085, Tandem drive transmission. Hydraulic shiftable moldboard, hydraulic tilt moldboard and blade, scarifier.

Galion 118 Diesel Motor Grader

S/N GMD 22677. International Engine. Tandem drive creeper transmission. Hydraulic shiftable moldboard and blade, scarifier.

Galion 503 Gas Motor Grader

Jackson Vibrator Compactor. Creeper transmission, tandem drive hydraulic power control, leaning front wheels, power circle reverse, hydraulic shiftable moldboard.

Galion Chief 10 Ton, 3 Wheel Gas Roller

S/N CG15952. Hercules WXLC-3 Engine. Electric starter, hydraulic steering and 24" cast rear rolls.

All of the equipment is in good condition and can be seen at 119 West Lake Avenue, Bellefontaine, Ohio.

WENDEL E. KNOWLTON

119 W. Lake Ave. - Bellefontaine, Ohio
Phones - 2-7881 - 2-7499

BAILEY BRIDGES

U.S. Army Engineer Equipment

PORTABLE — PREFABRICATED

Variable Span & Capacity

Immediate delivery from local stock

RENTALS - SALES

BAILEY BRIDGE RENTALS & EQUIPMENT

1325 Archer St. — P. O. Box 753
San Luis Obispo, Calif.

Tidelter Equipment Co. — Coordinated Equipment Co.
2500 Colorado Ave. — 1815 South Santa Fe Ave.
Santa Monica, Calif. — Compton 2, Calif.

CRUSHING EQUIPMENT

UNIVERSAL—TDS-30 Portable Screening & Crushing Plant, 30" twin dual roll, 3x12—2½ deck screen, rotovator, 30" Conveyors, Cat Diesel.*

GRUENDLER—3XD Portable Plant, 3XD hammermill, apron feeder, 3x6 screen, and Cat D8800 power. $8,500.

19 TRANSIT MIXERS

REX—5 Yd. Mixer, flush tank, Chrysler power, on 1955 GMC 620 tandem, air brakes. Rebuilt.

REX—3½ Yd. Mixer, large tank, Chrysler power on International LF174 5-speed, 3-speed, perfect.

SMITH—4½ Yd. Mixer, small water tank, Continental power, open end, good shape—late model.

CRANES & SHOVELS

1—LORAIN "TL-25K" ¾ yd. Diesel Dragline, rebuilt.

1—INSLEY "K-12" ½ yd. Trench Hoe, rebuilt.

4—BANTAM "M-49" ⅜ yd. Hoes or Draglines mounted GMC 6x6's.

1—BANTAM "H-47" Mounted on Chev. 4x4, Hoe or Drag, priced low.

1—Manitowoc "2000" Used Shovel Attachment.

1—P&H "225A" *New* Shovel Attachment, complete, discounted.

1—LORAIN "TL-20" *Used* Shovel Attachment.

*All the Above Equipment is Located here is Rockford except **

TERMS! TERMS! TERMS!

EIGHMY EQUIPMENT COMPANY

ROCKFORD, ILLINOIS

FACTORY TRADE-INS

CRANES — SHOVELS — HOES — DRAGLINES

1¼ yd. **BAY CITY 95** crane with 60 ft. boom, Caterpillar engine. 1946 model in good condition with power boom hoist and third drum. Crawlers are 12½ ft. long and 12 ft. wide. Located in New York. #4714.

3 yd. **P&H 1066 SHOVEL** with 28 ft. boom and Buda diesel engine. Has power boom hoist, high gantry, Kohler light plant and electric-hydraulic controls. In good condition, located in Illinois. #10475

5 yd. **MARION Type 111-M DRAGLINE** with 80 ft. boom and Hendrix bucket. Used only 2200 hours, this machine is fully equipped with long, wide crawlers, Caterpillar D-375 engine, floodlights and high gantry. In excellent condition, priced for quick sale. Located in Pennsylvania. #23010

¾ yd. **MARION 36-M DRAG-CLAM** with 70 ft. boom and GMC engine. Has 12 ft. 9 in. long crawlers, 10 ft. 7 in. wide with 36 in. pads. Full air controls with independent boom hoist and high gantry. 1958 model in excellent condition, located Arkansas. #21909

¾ yd. **MARION 32-M DRAGLINE** with 45 ft. boom, Continental gas engine. Has power boom hoist, manual controls. Built in 1955 and in good condition. Crawlers are 11 ft. 4 in. long, 9 ft. 11 in. wide with 35 in. pads. Located in Ohio. #21369

1 yd. **MARION 42-M HOE** with 24 ft. boom, 11 ft. handle. GMC engine with torque converter. Crawlers 13½ ft. long, 11½ ft. wide with 30 in. pads. Fully air controlled and in excellent condition, new in 1948; located in Ohio. #23032.

¾ yd. **MARION 36-M SHOVEL** with 18 ft. 8 in. boom and 16 ft. 4 in. handle. GMC engine, power boom hoist, 5150 lbs. ballast. Crawlers are 11 ft. 4 in. long and 9 ft. 11 in. wide with 26 in. pads. Full air controls and in excellent condition, 1956 model, located in Kansas. #21731

2½ yd. **P&H 655 DRAGLINE** with 17 ft. long, 12 ft. 4 in. wide crawlers, 75 ft. boom. Has Caterpillar engine and Kohler light plant. Good condition, 1946 model, located in Pennsylvania. #7057

2½ yd. **BUCYRUS-ERIE 84-B SHOVEL-DRAGLINE** with 55 ft. drag boom and 42 ft. shovel boom with 28 ft. handle and 2 yd. dipper. Has Caterpillar engine, high gantry, manual controls, running boards all around and Kohler light plant. Good condition, 1947 model, located in Pennsylvania. #41735

2½ yd. **P&H 955-A SHOVEL-DRAGLINE** with 70 ft. boom. Powered by Waukesha engine. Has 15 ft. 7 in. long, 12 ft. 6 in. wide crawlers. Kohler light plant and extra parts—in good condition, new in 1951, located in Arizona. #14844

3½ yd. **FARION 111-M SHOVEL** with 48 ft. boom, 24 ft. handle. Powered by GMC diesel engine. 20 ft. long, 15 ft. wide crawlers. Has high gantry, Kohler light plant, in fair condition, new in 1947. Located in Pennsylvania. #8607

¾ yd. **MARION 36-M HOE** with 20 ft. boom, Amazo dipper with 36 in. side cutters, GMC engine, air controls, power boom hoist. Excellent condition, new in 1956, located in Virginia. #21076

5 yd. **MARION Type 111-M DRAGLINE** with 80 ft. boom and Hendrix bucket. Used only 2200 hours, this machine is fully equipped with long, wide crawlers, Caterpillar D-375 engine, floodlights and high gantry. In excellent condition, priced for quick sale. Located in Pennsylvania. #23010

MARION POWER SHOVEL COMPANY
MARION, OHIO

TWX-MRON O 274-U
WESTERN UNION-WXMS MARION, OHIO

P.O. BOX 505
PHONE 2-1151

FOR SALE

Caterpillar D-4, wide gauge, 7U Series w/Cat. Hyd. Bulldozer.
Caterpillar D-8, 2U Series, w/stick, DD CCU and Cat. Bulldozer.
(2) Caterpillar DW-15 Tractors and Scrapers 45C Series.
International TD-24 Tractor w/Torque Converter, DD CCU and live Push Block.
Northwest Model 25 Pullshovel, 16000 Series, Murphy Diesel Engine.
International West Coast Special Tractor with 275 HP Cummins Diesel Engine, Garwood Winch and 35-Ton Lowboy Trailer.

CLAY EQUIPMENT CO.
2327 Hudson Phone: EAst 2-4547
DENVER 7, COLORADO

TRUCK CRANE BARGAIN

20-TON LORAIN MC-4

Equipped with 80' Pin Type D-7 Boom and 15' Jib, in A-1 Condition. F.O.B. East Chicago, Indiana $13,000.00

BAY CITY 150 T 40

70' Pin Type Boom, 10' Jib.... $13,500.00

J. D. ROCCO CO., INC.
Telephones: EXport 7-4308 & EXport 7-4309
Address: 1520 East Chicago Avenue
EAST CHICAGO, INDIANA

DRAGLINE MATS

Any Length, Width or Built to Specifications
We build them a little better for a little less.
STRICTLY HARDWOOD.

Also LUMBER and PILING

Kent Piling Co., Inc.

T. W. "TOM" KENT, PRESIDENT

Phone Days: Amite 2641 - 2644 - Night 8454
FLUKER, LOUISIANA

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

BILL FISHEL
Vandeventer Auto Sales
717 So. Vandeventer St. Louis 10, Mo.
Ph. Franklin 1-1750

D-2 CAT, 3J ELECT. start, hyd. blade and towing winch, new late type bottom rollers, new axle, overhauled, ready to go $1800. ¾ yd. Erie digging slam with teeth, extra good, $650. 1 set TD9 loader, flat pads, as new, $200. 1 set TD18 street plates for over grousers, $100. 5 Cat 12 grader rims, 20", $40.00. One each LaTourneau DDPCU for D7 and D8 with shafts, $200 each or $350 for both. LaTourneau scraper, 12 yd. J model, extra tires, $1000. TD18 w/16' cable blade and DDPCU, engine, clutch, trans., and final drive overhauled, $3500, 15' travel trailer V, good $600. Construction shanty, 8'x16', two section, bolted, with wood floor, $125. Backhoe and shovel front, ¾ yd., for Buckeye 70, $1300 for both. Sanders Contractors, Brooklyn, Michigan. Lyric 2-2187 @ 6 P.M.

Clearing House Ads Bring Results

Experienced Equipment For Sale

1—T-35 Schield-Bantam with Backhoe & 30' Drag—Reconditioned
1—M-47 Schield-Bantam Backhoe—Good Condition
1—M-40 Schield-Bantam Backhoe
1—175AD Michigan Tractor Shovel—Completely Overhauled. Excellent Buy
1—K5800 Isaacson 8-11 c.y. Scraper—Good Condition
1—Adams 301 Motor Grader
1—Adams 512 Motor Grader—Complete Overhaul—Includes V-Plow & Wing
1—Adams 550 Motor Grader with Scarifier—New Style Transmission
1—660 PowerGlow Adams Motor Grader—Demonstrator
1—Cat #12 Motor Grader—4T Series with Scarifier—Complete Overhaul
1—Cat #112 Motor Grader—Reconditioned
1—V-Plow & Wing for Cat #12 Grader
2—60" Sheepsfoot Rollers
1—Cat D-4 Dozer—Complete overhaul
1—Taree SB-7½ Scotchman Salt Spreader—Demonstrator
1—Kolman SB-80 Vibrating Screen—Good Condition
1—Cleaver-Brooks Mdl. PSME-50 Portable Steamer—Reconditioned
1—Mdl. 61-BH Snow Plow for HM Payloader—Near new
1—Wausau V-Plow Model TM4-FSS—Plow Only
1—Snow Bucket for Davis Model 100 Loader
1—Single Axle Low Boy Trailer—Heavy Duty—Good condition
1—B.G. Conveyor—30"x50'—IHC Watercool Eng.—Trap-Kolman SB70 Screen
1—Goodroad Model 12 Chip Spreader
1—LeT. Model TE Winch with TD-18 Adapter
1—½ c.y. Clam Bucket
1—Northwest Model 25 Dragline
1—200 Michigan Tractor Dozer—Demonstrator

SHEEHAN-BARTLING, INC. OF SIOUX FALLS

P. O. BOX 817 SIOUX FALLS, SOUTH DAKOTA ED 4-5881

TIRE SPECIALS

Perfect Used High Tread Tires

SIZES

3000 x 33	3000 x 40
2400 x 29	30 - 33
2700 x 33	56"

For Information Call Collect: HAmilton 1-7177 Or Write:

DALLAS TIRE & RUBBER CO.

2009 Hickory Street
DALLAS, TEXAS

IN STOCK FOR IMMEDIATE SHIPMENT
STEEL PIPE

LINE PIPE SEAMLESS (Used)
Very Good Condition
15,000' 20" OD X .312 65.71#/ft.
16' to 25' Lengths
Ends square cut for Dresser Couplings
FOB TIOGA, PA.
2,500' 10¾" OD X .250 28.40#/ft.
DRL, Bev. Ends
FOB WOODHULL, PA.

STEEL PIPE (used)
For non-pressure use
1,610' 36" OD X .375 142.68#/ft.
3,500' 40" OD X .438 185.06#/ft.
8,500' 40" OD X .375 160.00#/ft.
880' 48" OD X .375
FOB PITTSBURGH, PA.

FUSION ELECTRICWELD
(Limited Service)
3,000' 24" OD X .312 79.05#/ft.
SRL & DRL, PE
400' 26" OD X .312 85.73#/ft.
SRL, PE

FOB DETROIT, MICH.

STRUCTURAL ELECTRICWELD
373' 8⅝" OD X .095 8.65#/ft.
7,460' 8⅝" OD X .188 16.94#/ft.
122' 12¾" OD X .095 12.84#/ft.
204' 12¾" OD X .134 18.06#/ft.

FOB JACKSONVILLE, FLA.

Reserve Your Requirements Now

Write, Wire or Phone BRowning 6-3100

FOSCO FABRICATORS, INC.
P. O. BOX 901 PITTSBURGH 30, PA.

All items offered subject to prior sale

USED EQUIPMENT ON HAND

1—32' 7" Trainmobile Tandem Platform $2,490.00
1—15 Ton Phelan Lowbed 1,595.00
1—21 Cubic Yard Bottom Dump Hopper 3,500.00

NEW EQUIPMENT ON HAND

1—21 Cubic Yard Bottom Dump Hopper 4,250.00
1—20 Ton Lowbed Roar Ramp.. 3,774.00

BIRMINGHAM MFG. CO., INC.
14 South 55th St. - Tel. WO 1-6183-4-5
BIRMINGHAM 12, ALABAMA

Lowbed, Platform, Logging and Oilfield Trailers, Models Up To 265 Ton Capacity. Good Distributor's Territory Open.

FOR SALE

1—**Vermeer** 5424T Trencher. Very good.

1—**Caterpillar** D6 Dozer, cable control—good condition.

1—**Chicago Pneumatic** 105 CFM Compressor—good.

1—**John Deere** 4401C with loader and ripper—like new.

1—**Massey-Ferguson** WorkBull with loader 3 pt. hitch, excellent.

EMBRY TRACTOR AND SUPPLY COMPANY

P. O. Box 8 Shively Station
Louisville 16, Kentucky

Steel Sheet Piling In Stock

800 pcs Larssen 11-20, 25, 30'-La.
90 " Beth. AP-3-15'-La.
400 " Larssen II 20, 30, 40'-Fla.
900 " Carnegie MP-115-15, 20, 25, 60'-Fla.
80 " 12" 53 lb. 60' Bearing Piles Fla.
400 " 15' Corrugated LW-Fla.
770 " Carnegie MP-116-25, 30, 40, 60' Fla.
300 " 10" 53# 60' Bearing Piles-Fla.
No. 400 & 800 Vulcan Pile Extractor
983, 6A McK. Terry Hammers

SEABOARD STEEL CORP.
P. O. Box 5071 - Sarasota, Fla.
Telephone: Ringling 7-0461

SAVE $400.00 Sale—Brand New WAYNE AIR COMPRESSORS, latest model current production, 2 cylinder, 2 stage, heavy-duty 3 belt drive, 20.0 c.f.m., 175 lbs. pressure, 5 h.p. GE Motor A.C., 3 ph., 60 cycle, 220/440 v., complete with push button start/stop switch and all safety controls. All warranties attached and apply. Price less than wholesale. Regular $989 only $590, *delivered*. Larger sizes 7½-20 h.p. also available. Buy with confidence, satisfaction guaranteed. DGB rated accounts shipped net 10 days.

GEST MOTORS

2925 Ridge Ave., Philadelphia 21, Pa.

BLASTING MATS
ALL Standard Sizes In Stock
Made of ½" - ¾"x½" - ¾" - ¾"x¾" & ¾" Wire Rope Const.
Write or Call for prices
Vitiello Blasting Mat Co.
524 Lonsdale Ave., New York 58, N. Y.
Tel. Dayton 9-4575

FOR SALE

TDC 241 Dozer, DDPCU, Torque Converter, 1956 Machine, 2416 Total Hrs. Excellent Condition.

275A Michigan, 1958, Total Hrs. 2370 Cummins 265 HP, 4 Yd. Bucket Like New.

CAT 12 Grader 8T13819 SN Total Hrs. 5912, Power Steer, Excellent Condition.

LEYDECKER BROS., INC.
5015 Seneca Street
Ebenezer, Buffalo 24, N. Y.
Phone HO 2431

For Sale
USED EQUIPMENT

10'x6" face form, used on one job; $18.00 per 10-ft. section.
10'x12" form, used on one job; $16.60 for 10-ft. section.
10'x6" form, used on one job; $10.20 for 10-ft. section.
10'x12" flexible form, used on one job; $18.00 for 10-ft. section.
10'x6" flexible form, used on one job; $12.30 per 10-ft. section.
10'x4" form, used on one job; $8.60 for 10-ft. section.
24-inch division plates, used on one job; $3.45 each.
Target Concrete Saw, used on one job; $275.00.
Pump for joint sealing, used on one job; $450.00.
Ford Tractor-loader and blade, good condition; $850.00.
Ford truck 1½-ton 1954, good condition; $700.00.
Ford truck, 2-ton 1956, good condition.; $1,000.00.
Chevrolet ½-ton 1958, good condition; $1,300.00.
Other miscellaneous tools and equipment.

This equipment located at Richards-Gebaur Air Force Base, Grandview, Mo., and Ft. Leonard Wood, Mo.

Contact J. W. Bateson & Co., Inc., ED. 1-1775, Kansas City or Phone 2000 Ext. 1025, Ft. Leonard Wood.

write
Box 267, Grandview, Mo.
or
Box 37 Ft. Leonard Wood, Mo.

CALL UPON *MUTUAL* FOR THE NATION'S LARGEST

PARTS STOCK

Headquarters All Heavy-duty Equipment, Supplies & Parts

• DUMP TRUCKS • LOADERS • CRANES • ENGINES

Lowest Prices - Complete Satisfaction Guaranteed

NEW and Guaranteed REBUILT ENGINES

Completely Dynamometer "Run-In" and Tested in our own modern extensive rebuilding shops.

• HERCULES • CUMMINS
• CONTINENTAL • WAUKESHA
• GMC DIESEL

2000 S. WABASH AVENUE
CHICAGO 16, ILLINOIS

25TH YEAR OF QUALITY SERVICE TO THE HEAVY EQUIPMENT INDUSTRY!

MUTUAL TRUCK PARTS Co., Inc.

Telephone: CAlumet 5-3500

USED EQUIPMENT

4 Cat. "12" Motorgraders 8T Series

3 D-8 Cat. Tractors, 2U Series

8 Euclids FDT with 671 GMC and 13 Cy. bottom dumps

Link Belt Model K55 Dragline 2½ yd. with 90-ft. Boom I.H.—UD-24 Diesel Power

2 Autocar diesel trucks, 200 HP Cummins Cat. D-6 Tractor, cable & blade, Serial No. 9U-19754

Other Bargains

KELLEY TRUCK SALES

1025 Roosevelt San Antonio, Tex.
LE 4-2801

SAVE 70%

22 TON EUCLID REAR DUMPS

300 H.P. Diesel Engine, Quarry Bodies

Very liberal terms. Limited numbers available, so hurry.

Reid-Holcomb Company, Inc.

Indianapolis, Indiana - Phone: MElrose 2-4433

You can't "BEAT the BRUSHES"

that are made by DALLAS BRUSH

Call "Mr. Van" the Friendly Brush Man

Rotary Sweeper Broom Cores
Road Drag Leveler Brooms
Street Push Brooms

New & Used Brushes for Every Industrial Need

DALLAS BRUSH MANUFACTURING CO.
5108 Westmoreland FL 7-6581
Dallas 7, Texas
N. S. Van Deventer, Owner

FOR SALE

EUCLIDS

Rear, Bottom and Scrapers

8½ yd. Bucyrus-Erie Shovel
8 yd. Bucyrus-Erie Shovel
2½ yd. Bucyrus-Erie Shovel
8 yd. Bucyrus-Erie Dragline
5 yd. Bucyrus-Erie Dragline
2½ yd. Northwest Shovel
3½ yd. P&H Shovel
1½ yd. Marion Shovel
8 yd. Lima Dragline
3 yd. Lima Dragline
2 yd. Lima Shovel
5 yd. Manitowoc Shovel
5 yd. Manitowoc Dragline
2 yd. Lorain Dragline
1 yd. Lorain Backhoe

"Other equipment available not listed above"

WILLIAM LUBRECHT, III.
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Gladstone 5-4041 - 5-0233

SHOVEL PARTS

LIMA - Paymaster, ¾ yard - Manganese Lip complete $1,750.00
LINK BELT - 18 ft. boom, 14 ft. stick, special for 85 Speeder - can be modified for any ½ or ¾ yard. New - never been used 750.00
⅜ Yard - Near new - can be modified to fit any ½ or ½ yard machine 350.00
BARBER-GREENE LOADER - Model 522 - practically new belt and tires - runs good - LeRoi engine 750.00

McNALL MACHINERY
600 D Avenue N.W.
Cedar Rapids, Iowa

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:

• Linden, New Jersey
• Ft. Lauderdale, Florida
• Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000
In Florida Call: Port Everglade Steel Co.
Ft. Lauderdale—JA. 4-6548
In Houston Call: G. Oliver—GA. 4-7234

SALE
GOVERNMENT SURPLUS
HEAT TREATED
CAPSCREWS

¾"x3¼	Hex Head—16NF2
¾"x3"	Hex Head—16NF2
¾"x2¾"	Hex Head—16NF2
¾"x2¼"	Hex Head—16NF2
¼"x3"	Oval Head—16NF2
⅞"x3/	Hex Head—14NF2
7/16"x4⅛"	Hex Head—NF
7/16"x2"	Hex Head—20NF2 ZP
7/16"x1½"	Hex Head—14NC

All prices F.O.B. Kenmore, New York
All Sizes $15.00 Per 100 Lbs.
20% off 2000 or more
ROLLING EQUIPMENT CO.
1127 Military Rd. Riverside 4919
KENMORE 17, NEW YORK

EUCLID TRUCKS
"36TD"
3—Model 36TD Euclid 22½ ton rear dumps, new 1956, Cummins 300 H.P. Engine, torque converters. Like new. Price $17,000 Each.
FRANK FAMALETTE
EQUIPMENT COMPANY
764 N. Locust St., Hazleton, Pa.
GL 5-4708 - GL 5-4196

Traffic Safety

Heavy Vehicles Helped Up Wyoming Grade

An example of public service that pays in good will and a lessening of the accident rate is that offered to motorists by the Wyoming highway department. The department's courtesy towing service in Shoshoni Canyon west of Cody, US 14-20, handled 316 tows during July, 1959.

According to the department, 152 house trailers, 103 passenger cars, 32 miscellaneous type trailers, 27 busses and 2 trucks required assistance in climbing the steep grade east of the Buffalo Bill Reservoir Dam. A summer-employed university student operated the tow truck, showing a quick eye for vehicles likely to have trouble on the steep winding road. Using an industrial type tractor, he helped the drivers over the summit. A canyon road in construction will have greatly reduced grades.

PUMPCRETE MACHINE
FOR SALE. REX Model 160-5 PUMPCRETE Machine. Serial CZ669, complete with approx. 500 ft. 6" pipe and assorted fittings and specials. Good condition. Operated approx. 100 hrs. since complete factory overhaul.
CARLO BIANCHI & COMPANY, INC.
Framingham (Tel. TRinity 2-4341) Mass.

A SWEEPING REVISION OF PROCEDURES for handling disabled vehicles along the 553-mile New York Thruway is announced. Authority personnel and state police in their patrols will now provide gasoline and water and lend small tools as jacks free to motorists they encounter during their routine duties.

Oil companies operating Thruway service stations will maintain trucks, manned by trained personnel, to handle roadside repairs such as flat tires, broken fan belts and work that can be done at the roadside between Nyack and Buffalo and on the Berkshire Section.

Private off-Thruway garages, under agreements with the Authority, will handle all towing and major repair jobs that cannot be done along the road, on a flat agreed charge basis.

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?
Unless you send this information directly to use we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS DATE_____

22 WEST MAPLE STREET, CHICAGO 10, ILL.

☐ I do receive ROADS & STREETS and wish to continue to receive it.
☐ I do not receive ROADS & STREETS but would like to have it.

NAME

TITLE OR OCCUPATION

FIRM NAME OR GOVERNMENT DEPARTMENT (give street address)

CITY ZONE (if any) STATE
(If you have moved give *old and new* address)

SIGNATURE

Manufacturers' Literature

EPOXY RESINS: A detailed technical explanation of the reasons behind the high adhesive qualities of epoxy resins is given in a booklet from Commercial Chemical Company, 1021 Summer St., Cincinnati 4, Ohio. Included in the literature are the uses of epoxys, definitions of relative terms and a listing of the company's various epoxy coatings and adhesives.

For more details circle 166 on Enclosed Return Postal Card.

CONSTRUCTION PRODUCTS: The publication of a new Products Directory is announced by the Rocky Mountain Export Company, P. O. Box 1051, Denver 10, Colo. In the 16-page booklet, hundreds of items for the construction and geophysical fields are listed. Related items are packages for shipment with special attention given to custom specifications. Also, the firm is able to quote on extensive and major projects outside North America.

For more details circle 167 on Enclosed Return Postal Card.

PORTABLE BATCH PLANT: A bulletin describing the "Gopher," a portable transit-mix plant able to weigh out up to 70 cu. yds. of aggregate and cement an hour, is available from the C. S. Johnson Company, P. O. Box 71, Champaign, Ill., a division of Koehring Company. Bulletin explains how the unit can be operated as either a complete remote-controlled plant, or as three independent units—a 285 bbl. Porto-Silo wih 4000 lb. capacity cement batcher, a 6-yd. portable aggregate batcher with 24-in. belt conveyor, and a 40-ton capacity aggregate storage bin.

For more details circle 168 on Enclosed Return Postal Card.

COMPACTION EQUIPMENT: An illustrated four-page folder from Yuba Consolidated Industries, Southwest Welding & Manufacturing Division, 3201 W. Mission Rd., Alhambra, Calif., shows the firm's multiple box compaction roller, self-propelled rollers, sheepsfoot rollers and sprinkle tanks. Photos of each piece of equipment are accompanied by a detailed explanation.

For more details circle 169 on Enclosed Return Postal Card.

RETARDATION IN CONCRETE: Retardation of initial set in concrete is the subject of two bulletins issued by the Dewey and Almy Chemical Division, W. R. Grace & Co., Cambridge, Mass. They are "Retarders and Plastic Concrete" and "Retardation of Initial Set: Effect on Hardened Concrete." The bulletins are numbered 438-7 and 438-8 respectively.

For more details circle 170 on Enclosed Return Postal Card.

DRILLING & BORING EQUIPMENT: A new 12-page bulletin describing the Ka-Mo line of horizontal, vertical, and angular drilling and boring equipment is available from the Kwik-Mix Company, Port Washington, Wis., a division of Koehring Company. Bulletin No. KMO-633 discusses the wide variety of air, hydraulic, electric, and gasoline powered Ka-Mo drills available, and has on-the-job photos of Ka-Mo equipment working in clay, sand, gumbo, frozen ground, shale, limerock, etc.

For more details circle 171 on Enclosed Return Postal Card.

EXCAVATING MACHINE: A highly illustrated booklet shows on-the-job application of the Eimco 105 Excavator produced by the Eimco Corporation, Tractor Loader Division, 634 S. Fourth St., Salt Lake City 4, Utah. Three jobs where the excavating machine was used are the Glen Canyon Dam diversion and access tunnels, the Fort Pitt Tunnel, and the Mammoth Pool Diversion tunnels. For each site, specifications and conditions are listed. Also contained is a complete data table showing all measurements and weights of the unit.

For more details circle 172 on Enclosed Return Postal Card.

FRONT END LOADER: Facts and specifications are contained in a new brochure on the Eimco 126 Front End Loader, now available from The Eimco Corporation, P. O. Box 300, Salt Lake City 10, Utah. This crawler unit is equipped with 205 hp diesel engine teamed with the company's "Unidrive" transmission, single stage torque converter and dual final drives, for ease of maneuverability and control. The brochure illustrates the spinturn ability of the unit and lists the features which include loading cycle speed and full English and Metric specification of the machine.

For more details circle 173 on Enclosed Return Postal Card.

CRANES, HOISTS: A full line of hoist products for overhead handling of loads from ¼-ton through 60 tons is described in a new catalog offered by The Harrington Company, Plymouth Meeting, Pa. Covering more than 20 different kinds of cranes, hoists, and specialty and accessory items in the Peerless line, the 12-page illustrated catalog is said to contain equipment meeting virtually every overhead handling requirement.

For more details circle 174 on Enclosed Return Postal Card.

OVERMAN

STONE AND ASPHALT SPREADER

A BIG-JOB PAVER AT A SMALL-JOB COST

You can do fast, high-quality paving with this small, compact, low cost machine. Lays any type commercial asphalt. Easily handled on small jobs, highly efficient on the largest job. A proven money-maker for contractors and highway departments everywhere.

GET THE FACTS . . . WRITE FOR DESCRIPTIVE BULLETIN TODAY.

I. J. OVERMAN MANUFACTURING CO.
BOX 896 MARION, INDIANA

. . . for more details circle 335 on enclosed return postal card

Manufacturers' Literature

C-6 Tractors: Euclid Division of General Motors, Cleveland 17, Ohio, has released a 24-page brochure on the Model C-6 crawler tractor. The tractor has had 5 years of exhaustive tests, both in the field and at the General Motors Proving Grounds. This full-color booklet, No. 607, shows photographs of job applications, cutaways, sectional views and drawings that explain full-power shift, "Torqmatic" drive, hydraulic track tensioning and other design and operating features of the tractor. Condensed specifications and performance charts, as well as data on hydraulic and cable control attachments are also included.

For more details circle 175 on Enclosed Return Postal Card.

Safety Gloves: A broad line of coated fabric work gloves for hand protection is described in a bulletin recently issued by Mine Safety Appliances Company, 201 N. Braddock Ave., Pittsburgh 8, Pa. The four-page folder illustrates basic types of glove materials available, including neoprene, natural rubber, and vinyl plastic in standard, flexible, and super-flexible styles. Glove linings are listed as jersey, canton flannel, and interlock fabric. Included in the bulletin is a chart evaluating the chemical resistance of glove materials to a wide variety of acids, caustics, ketones, hydrocarbons, and solvents.

For more details circle 176 on Enclosed Return Postal Card.

Stud Welding Fasteners: A new book detailing complete standards and specifications for stud welding fasteners has been published by K S M Products Inc., Merchantville 8, N. J. The book describes the stud welding system and provides complete engineering data in addition to stud welding fastener specifications; each page is prepared in format similar to an engineering drawing. Weight charts and special machining operations are shown as well as pictures and descriptions of standard stud welding equipment. This book is available on letterhead request only.

For more details circle 177 on Enclosed Return Postal Card.

Post-Tensioning For Prestressed Concrete: A new 16-page engineering data bulletin from Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill., describes force development calculations, detailing and placement plans, tendon and anchorage assemblies, stressing and grouting equipment, and field labor procedures for cast-in-place and pre-case post-tensioned concrete construction. Detailed drawings show simply and clearly proven methods of post-tensioning. Also shown are many buildings, bridges and other structures made possible with prestressed concrete. Write for bulletin 70-6.

For more details circle 178 on Enclosed Return Postal Card.

Sand Blasting Machines: New catalog #594 from Sanstorm Manufacturing Company, P. O. Box 1173, Dept. SE, Fresno, Calif., contains information on both open top and closed top pressure type sandblast machines; nozzles to be used in various operations: data tables on ratios of nozzle bore sizes to compressor capacities; and operator accessories. It also introduces data on the new Sanstorm high velocity blast nozzle which multiplies the surface area coverage that can be cleaned without equipment or abrasive alterations. Write for catalog on company letterhead.

For more details circle 179 on Enclosed Return Postal Card.

Weldment Wall Charts: A "how-to" wall chart from the American Brake Shoe Company, Dept. A, American Manganese Steel Division, 389 E. 14th St., Chicago Heights, Ill., gives step-by-step instructions for replacing tractor grouser bars. It also includes detailed ordering information for manganese or carbon steel bars covering all leading makes of tractors. A similar chart provides instruction and specifications covering two types of dipper tooth repointer and repointer bars.

For more details circle 180 on Enclosed Return Postal Card.

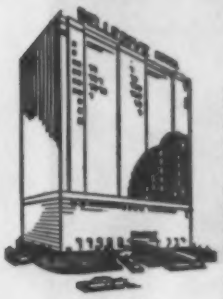
Replacement Parts: A complete reference manual of Velvetouch and Velvetouch Feramic replacement clutch plates, clutch facings, brake linings and matched facing sets for tractors, construction and mining equipment is announced by the S. K. Wellman Company, 200 Egbert Rd., Bedford, Ohio. The catalog presents various machinery makes in alphabetical order. These are classified according to serial number, original clutch make, clutch dimensions, drilling, quantity and types of rivets required. The correct part number for each unit is then listed.

For more details circle 181 on Enclosed Return Postal Card.

Trowels, Finishing Tools: A catalog devoted almost exclusively to the tools used by contractors and journeymen in the trowel trades can be obtained from the Goldblatt Tool Company, 1910 Walnut St., Kansas City 41, Mo. The primary trades, covered in the 72-page book are cement finishing, brick, block and stone masonry and others. Besides the traditional tools and equipment used by workmen in these trades, the publication shows many tools developed during the past few years. Among them are a masonry guide and estimating system, a new concrete finishing tool called the "Jitterbug Tractor" and complete power plastering equipment. Contractor's equipment in all trades is also shown.

For more details circle 182 on Enclosed Return Postal Card.

PREFERRED in KANSAS CITY, MO. by BUSINESSMEN, EXECUTIVES, FAMILIES



During certain convention periods, all available Kansas City hotel rooms are frequently taken.
You can be assured of comfortable accommodations in Kansas City, by writing for your FREE "Preferred Guest Card" from the Bellerive Hotel, today. The Bellerive—preferred by the family, and business executives for convenience and courteous hospitality at sensible rates—guarantees (with advance notice) reservations anytime of the year to you, the preferred guest. Ask for your "Preferred Guest Card", today . . . at no obligation. Free Radio & Television set in every Room. Rates from $4.50

100% AIR-CONDITIONED
Home of the famous Rhythm Room
Free Parking

BELLERIVE Hotel
214 East Armour at Warwick Boulevard
IN CHICAGO IT'S THE HAMILTON HOTEL
20 S. Dearborn Street

With the Manufacturers'___

HIGHWAY TRAILER COMPANY announces the appointment of B. L. Schroeder to the position of Western regional sales manager for the firm's Utility Division. Schroeder came to Highway Trailer in 1955.

CHARLES W. HEDDEN has been named by the Galion Iron Works & Mfg. Company to the position of district manager in the states of Kentucky, Tennessee, Georgia, Alabama and Mississippi.

THE UNIVERSAL ATLAS CEMENT DIVISION of the U. S. Steel Corporation has announced the promotion of Lloyd L. Schwarz to sales manager of the St. Louis territory. Schwarz has been with Universal Atlas since 1948.

GOODYEAR TIRE AND RUBBER COMPANY'S Topeka, Kansas plant plans for a $4 million expansion of earthmover tire production facilities. Tire building equipment will be installed by 1961 in a new building measuring 350 ft. by 100 ft.

MINNESOTA MINING AND MANUFACTURING COMPANY'S 14-story office building announced recently is the latest step in development of the research center site started 10 years ago, east of St. Paul. At present, seven buildings with a total of 560,000 square feet have been completed. Additions and two new buildings are under construction that will add another 205,000 sq. ft. to the center's facilities during 1960.

THE GARDNER-DENVER COMPANY has issued a booklet on their 100 year history. The publication was produced when this firm was honored by the Newcomen Society of North America.

G. M. PERRY, director of sales for Euclid Division of General Motors has announced several appointments that are a part of an expanded sales and service organization at the company's main office in Cleveland. G. E. Danby, L. A. Campbell, R. J. Schroeder, G. T. Gallaher and H. W. Middelron were among those promoted.

WILLIAM M. PHILLIPS has been promoted to the post of manager of the southern district for the Eimco Corporation, Salt Lake City, Utah. The announcement was made recently by Wayne L. Dowdey, Eimco general sales manager and former manager of this district. Phillips will be in charge of the sales in the Birmingham and Houston offices, primarily concerned with the marketing of products of the company's Filter and Process Engineers Divisions.

UNIVERSAL FORM CLAMP COMPANY has announced the promotion of Gary Cass, Chicago sales engineer, to the position of assistant sales manager. D. M. DeCanio, in announcing the promotion, stated that Cass will supervise various phases of sales training.

LETOURNEAU-WESTINGHOUSE COMPANY, Peoria, Ill., will conduct a number of motor grader service schools in the eastern and central United States during the next few months. The latest information on motor grader maintenance procedures will be available to construction people.

HIGH-STRENGTH BOLTING

Continued from page 90

connections bear identification symbols.

b. Visually, that bolts have been tightened by wrench sockets that leave a small score mark on outside faces of nuts (when such sockets are available).

c. Mechanically, that bolts have been torqued to at least specified minimum tension, using either a hand torque wrench calibrated for torque at minimum tension; or, the nut can be loosened slightly and the torque checked when it is brought back to its original tight position.

At least one bolt of each size in each connection should be checked; totaling at least 10 percent of bolts in larger connection. For bolts 7/8-in. in diameter and larger, a torque-controlled impact wrench which has been checked before the day's use, may be used.

The customer's inspector should be made familiar with the procedure for installing, tightening and checking A-325 high-strength bolts.

GETTING GOOD CONSTRUCTION

Continued from page 124

9. New Standard Specifications became effective January 1, 1960. (See Roads and Streets, January, 1960.) Because these are the result of a wide study of recommendations made by engineers, contractors, manufacturers, materials suppliers, etc., we believe they embody the latest accepted practices, with practical tolerances where end results are specified. Where method specifications could not be avoided, clauses have been up-dated relative to the equipment, materials, timing, processes, and other elements that enter into method specifications. The free exchange of information and solicitation for information between the contractors and engineers, where necessary, has made this possible.

PHILLIP B. STULL has recently retired from the Hercules Powder Company. His retirement comes after completion of 33 years as an executive with Hercules, including 27 years as a member of the board of directors.

CONCRETE TESTERS

The World's Finest Low-Cost Precision Testers For

CYLINDERS
CUBES
BLOCKS
BEAMS
PIPE

IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 · NEW CASTLE, PA.
U.S.A.

. . . for more details circle 302

The World's Finest QUALITY BLACKTOP SEALER

JETCOAT 707

• SEALS and PROTECTS
• WATERPROOFS
• RESISTS RUST
on any Asphaltic Concrete Applications

JETCOAT 707 resists • sun • battery acid • gasoline • frost • oil • road salts

• READY to USE — ADD NOTHING
• FIRM AT HIGHEST TEMPERATURE
• CLEANS EASILY — LOOKS NEW LONGER

Write for Circular . . .

JETCOAT CORPORATION
480 Brehl Ave., Columbus, O.

. . . for more details circle 323 on enclosed return postal card

Index to Advertisers

Acme Iron Works 160
Allied Materials Corp. 42
Allis-Chalmers ..... 28 & 29
Alpha Portland Cement Company 7
Armour Industrial Chemical Company ..... 138 & 139
Atkinson Company, Guy F. 164
Austin-Western 26

Bailey Bridge Rentals & Equipment .. 168
Barber-Greene ..... 148 & 149
Bateson & Co., Inc., J. W. 171
Beasley Machinery Co., Miller C. 162
Begane Paving Co. 162
Bianchi & Company, Inc., Carlo 172
Birmingham Mfg. Co., Inc. 170
Braubach Equipment Company 167
Brinker Supply Company 163
Brown-Strauss Corporation 168
Buffalo-Springfield Company .... 12 & 13

Capitol City Tire Company 161
Carlson Co., Inc., Fred 165
Caterpillar Tractor Co. .... 57, 58, 59, 60, 79, 123, Third Cover
Central Pennsylvania Quarry, Stripping & Construction Co. 168
Chain Belt Company ..... 71, 116 & 117
Chrysler Corporation, Dodge Division 97
Clark Equipment Company .. 72, 73, 74, 75
Clay Equipment Co. 169
Cleaver Brooks Co., Road Machinery Division 158
Cleveland Trencher Co., The 48
Colorado Fuel and Iron Corporation, The ..... 14 & 15
Construction Equipment Sales Co. ... 163

D-A Lubricant Company, Inc. 129
Dallas Brush Manufacturing Co. 171
Dallas Tire & Rubber Co. 170
Deere, John—Industrial Division 83
Dixon Valve & Coupling Co. 132
Dodge Trucks 97

Eastern Steel Products, Ltd. 124
Eaton Manufacturing Company, Axle Division 27
Eighmy Equipment Company 169
Ellis Heated Asphalt Rollers 160
Embry Tractor and Supply Company 170
Esnick Manufacturing Company 46
ESSO Standard, Division of Humble Oil & Refining Company ... 145
Etnyre & Co., E. D. 154
EUCLID Division of General Motors 25, 43
Evaluation & Sales Service 166

Famalette Equipment Co., Frank 161, 172
Fidelity and Casualty Company of New York, The 135
Firestone Tire & Rubber Co., The 33
Fisbel, Bill 169
Fisbel Equipment Sales Co., Al. .. 166, 168
Ford Motor Company, Industrial Engine Department 80
Ford Motor Company, Truck Division ..... 86 & 87
Forney's, Inc. 175
Fosco Fabricators, Inc. 170
French, James C. 165, 167

Frink Sno-Plows, Inc. 124
Fuller Manufacturing Company, Transmission Division 35

GMC Used Truck Dept. 164
Galan Trailer Co. 164
Galion Iron Works & Mfg. Co., The ... 92
Gardner-Denver Company ..... 100 & 101
General Tire & Rubber Co., The 41
General Truck Sales, Inc. 167
Gest Motor Co. 170
Goodrich Tire Co., B. F.—A Division of the B. F. Goodrich Co. 21, 22, 23
Goodyear, Truck Tire Dept. 5

H & H Equipment Company 161
Hancock Manufacturing Company 134
Harding, Leo. A. 163
Harrison Salvage Co., Jack 168
Hawkins Equipment Co. 165
Heil Co., The 164
Hetherington & Berner, Inc. 146
Highway Equipment Company 24
Hotel Bellerive 174

Industrial Electric Company 166
International Harvester Co. 166
International Harvester Company—Construction Equipment Division ..... 66 & 67, 99
International Harvester Company, Trucks ..... 16 & 17
Iowa Manufacturing Company ... 30 & 31

Jackson Vibrators, Inc. .... Second Cover
Jetcoat Corporation 175
Johnson Company, C. S. 10

Kennedy's Van Brush Mfg. Co. 160
Kelley Truck Sales 171
Kenmore Welding Corp. 162
Kennedy's Machinery Mart 164
Kent Piling Co., Inc. 169
Knowlton, Wendel E. 168
Koehring Division 11
Kolman Manufacturing Co. 167

LaPine Truck Sales, Inc. 163
LeTourneau-Westinghouse Company 37, 38, 39, 40
Leydecker Bros. Inc. 170
Lima Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation 3
Link-Belt Speeder Corporation 6
Littleford Bros., Inc. 143, 144
Lubrecht, III, William 162, 171

Mack Trucks, Inc. 159
Mack Trucks, Inc. ..... 120 & 121
Mack Trucks of Canada, Ltd. .. 120 & 121
Manitowoc Engineering Corp. 102
Marion Power Shovel Company 169
Maxon Construction Company, Inc. .. 131
McConnaughay Mixers, Inc. 157
McNall Machinery 171
Mid-States Pipe and Supply Co. 167, 168
Mississippi Valley Equipment Co. ... 165
Mutual Truck Parts Co., Inc. 171
Myers Equipment Company 166

National Lime Association 34
Newark Brush Company 32

Oldfield Equipment Co. 167
Oliver Corporation, The 91
Overman Manufacturing Co., I. J. ... 173

Pace-Euclid, Inc. 163
Parker-Parkinson, Inc. 161
Pasco Construction Co. 162
Pettibone Mulliken Corporation 106
Pioneer Engineering 65
Pit & Quarry Equipment Company ... 161
Portland Cement Association 94, 105

Reid-Holcomb Company, Inc. 171
Reo Division, The White Motor Company 93
Rex Construction Machinery ..... 71, 116 & 117
Rocco Co., Inc., J. D. 169
Rockwell-Standard Corporation 107
Rogers Brothers Corp. 122
Rolling Equipment Co. 172
Rosco Manufacturing Co. 151
Ross Porta-Plant 115

S & G Manufacturing and Equipment Corporation 161
Sanders Contractors 169
Seaboard Equipment Co., Inc. 170
Seaboard Steel Corp. 170
Seaman-Andwall Corporation 36
Shannon, J. Jacob 167
Sheehan-Bartling, Inc., of Sioux Falls 170
Shell Chemical Company, Plastics and Resins Division ..... 44 & 45
Silvestri Bros. 161
Simplicity System Co., The 153
Standard Oil Company (Indiana) 137
Stanhope, Inc., R. C. 166
Stoody Company ..... 110 & 111
Swabb Equipment Co., Inc., Frank ... 168

Texaco Inc., Asphalt Sales Div., ... Back Cover
Texaco Inc., Lubrication Division ... 8 & 9
Timken Roller Bearing Company, The —Rock Bit Division 18
Tractor & Equipment Co. 161
Troyer Equipment Company, Stanley B. 164

Udelson Equipment Company 165
Unit Crane & Shovel Corp. 47

Vandeventer Auto Sales 169
Vitiello Blasting Mat Co. 170

Walsh-Perini-Morrison-Kiewit-Utah Companies 162
Wenzel Machinery Co. 164
Western Services Corporation 171
Westport Machinery Co. 166
Williams Mfg. Co., Hugh B. 133
Wis. Industrial Truck Co. 166
Wyandot Dolomite, Inc. 168

JOB REPORT ON TWO CAT NO. 619 TRACTORS WITH MATCHING NO. 442 LOWBOWL SCRAPERS...

Hauling, as well as dumping close and maneuvering in tight quarters, the No. 619-No. 442 is proving its worth on the Park Hill Subdivision, Colorado Springs, Colorado. Typical performance pushloaded by a D8: On a 3700-foot round-trip haul, the No. 619-No. 442 averages 3.38-minute cycles and handles 15 to 16 bank yards per load for production of 220 bank yards an hour.

Good maneuverability, power and acceleration!

Alexander Construction Company is using two Caterpillar No. 619-No. 442 rigs for dirt work on the Park Hill Subdivision, Colorado Springs, Colorado. The project, which covers 340 undeveloped acres, will one day have 1282 homes. About 2,000,000 cubic yards of damp sandy loam are involved in the section where the machines are now shaping land, and the job calls for a great deal of close dumping and maneuvering in tight quarters. Operator Clarence B. Kusma sums up the No. 619s' performance this way: "They handle good. Turn short. Have well-located controls. Get up to 5th gear in about 1000 feet on the flat."

On this project, as on other projects, the No. 619-No. 442 is living up to its advance notices as an excellent "all job" rig. Here are some reasons why. Its Turbocharged Cat Engine provides 225 HP and high torque rise, ideal for lugging under load and for fast acceleration. Its LOWBOWL Scraper handles 14 cu. yd. struck, 18 cu. yd. heaped. It has 30 MPH usable operating speed, plus ground-hugging roadability never before found in a two-wheel tractor of comparable size. New 2-jack hydraulic steering makes it extremely easy to maneuver, yet retains that important "feel of the road" touch. And advance design permits full 90° turns and a turning diameter of 30 feet.

Get the full facts about the "all job" No. 619-No. 442 from your Caterpillar Dealer. Compare it with any two-wheel tractor of similar size for money-making performance. Ask for a demonstration—see for yourself how you can make use of its versatility to step up production on your job!

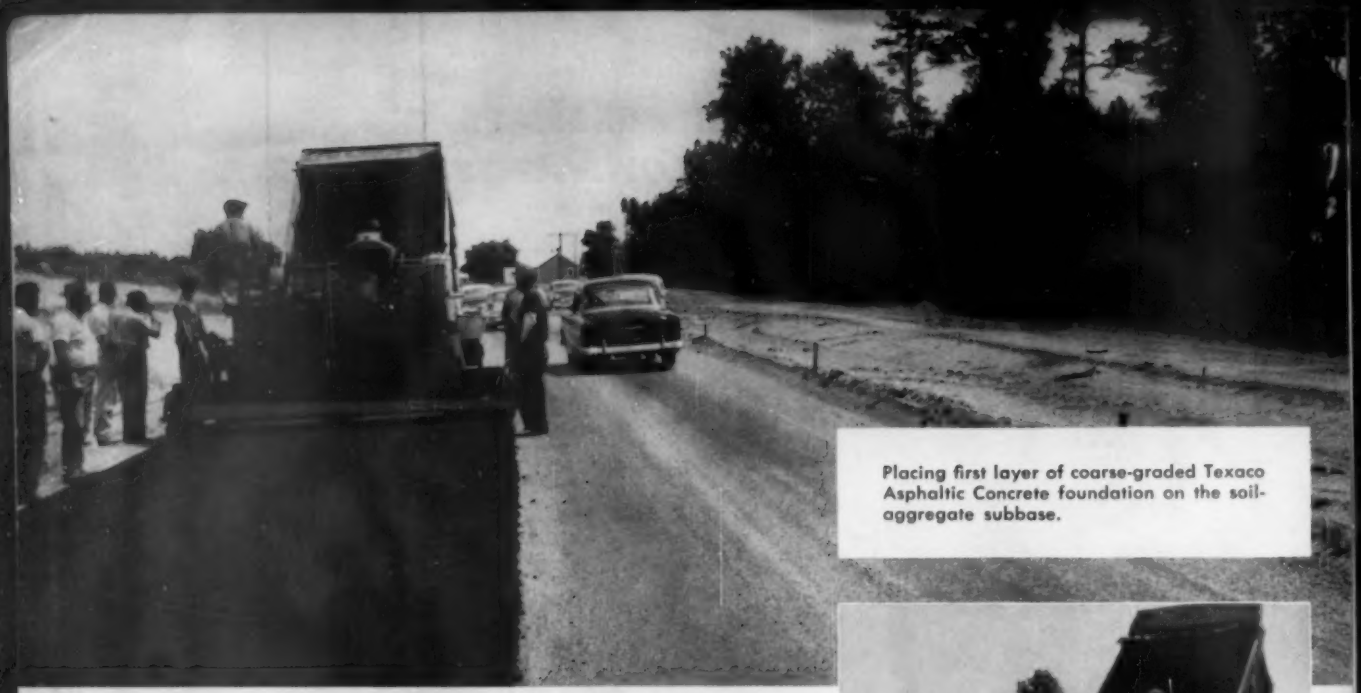
Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NO. 619-NO. 442 FOR "ALL JOB" VERSATILITY

. . . for more details circle 286 on enclosed return postal card



Placing first layer of coarse-graded Texaco Asphaltic Concrete foundation on the soil-aggregate subbase.

This Virginia highway needed a heavy-duty pavement

A 4½-mile section of U. S. Route 460 in Prince Edward County is an example of heavy-duty Texaco Asphalt paving as Virginia constructs it. Both the foundation and the wearing surface are of rugged plant-mix Asphalt construction. Coarse-graded Texaco Asphaltic Concrete was used for the 5½-inch foundation and fine-graded Texaco Asphaltic Concrete for the 1½-inch wearing surface. Under this asphalt pavement is a 5-inch soil-aggregate subbase.

Its performance on Virginia's primary highways recommends this heavy-duty type of Texaco asphalt construction for the Interstate Highway System. Not only does it absorb punishing impact year after year, with a minimum of upkeep, but its first cost is substantially lower than that of rigid paving of comparable design. Let Asphalt help give your State extra miles of modern roads for its highway dollars.

Helpful information on heavy-duty Asphalt paving, as well as the various intermediates and low-cost types of Asphalt construction, is supplied in two free Texaco brochures. Ask our nearest office to send you copies. There is no obligation.

Contractor: ADAMS CONSTRUCTION COMPANY, Roanoke, Va.

Constructing fine-aggregate Texaco Asphaltic Concrete wearing surface.

Durable, resilient, glare-free Texaco Asphaltic Concrete on 4½-mile section of U. S. Route 460 in Prince Edward County, Va.

TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17

Boston 16, Chicago 4, Denver 1, Houston 1, Jacksonville 1, Minneapolis 3, Philadelphia 2, Richmond 25.

TEXACO

REG. U.S. PAT. OFF.

TEXACO ASPHALT

. . . for more details circle 347 on enclosed return postal card